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FOURTEEN PERSONAL CASES OF PNEUMOCYSTIS CARINII PNEUMONIA*

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IN A RECENT PAPER[64] we reported a personal series of 13 Canadian cases of *Pneumocystis carinii* pneumonia. However, as the cases in this paper were discussed strictly from the viewpoint of pathological anatomy, we consider it worth while to give a description of the clinical side of the picture and to correlate it with our pathological findings. We have been able to add a fourteenth case to our series since then (Case 14 in Table I).

As is now widely known, the disease has been frequently observed in Europe (over 2000 cases reported) but until recently was thought to be nonexistent in Canada. However, after a detailed review of the autopsy material from Ste. Justine Hospital, Montreal, from the year 1927 on (5102 files were restudied and 3186 lungs were re-examined histologically for this purpose), we have found two cases dating as far back as 1930. Other cases were seen later in the reviewed material, and four were personally autopsied by the author (Cases 8, 9, 12 and 13, Table I). In addition to the cases encountered at Ste. Justine Hospital one case was found in the old autopsy material of the Montreal Children's Hospital (Dr. F. W. Wiglesworth) and this goes back to the year 1934. Another quite recent case was observed at Notre-Dame Hospital, Montreal (Drs. L. C. Simard and S. Lauzé). A third typical case was very recently diagnosed by Dr. J. P. Thériault at Maisonneuve Hospital, Montreal. The last three cases are added to our series by kind permission of the respective pathologists. Thus our series consists of the 14 cases shown in Table I.

TABLE I.—OUR SERIES OF 14 CANADIAN CASES OF PNEUMOCYSTIS CARINII PNEUMONIA.

Case number	*Sex*	*Prematurity*	*Date of death*	*Age at death*	*Autopsied at*
1.	F	Yes	26/ 5/1930	2½ months	Ste. Justine Hospital
2.	F	No	26/10/1930	2½ "	" "
3.	M	?	29/ 8/1935	2½ "	" "
4.	M	No	1/11/1936	4 "	" "
5.	M	Yes	27/ 7/1941	3½ "	" "
6.	M	Yes	30/ 1/1947	2½ "	" "
7.	M	Yes	13/ 4/1947	3 "	" "
8.	M	No	28/ 7/1955	2 "	" "
9.	F	No	22/ 8/1955	3 "	" "
10.	F	?	4/ 8/1934	3 "	Montreal Children's Hospital
11.	F	?	28/ 1/1958	2 "	Notre-Dame Hospital
12.	F	No	20/ 1/1958	3 "	Ste. Justine Hospital
13.	F	?	12/ 2/1958	2 "	" "
14.	M	?	8/ 4/1958	2½ "	Maisonneuve Hospital

Nine of these cases were lent to Dr. J. W. Gerrard for statistical purposes, and have been mentioned in his recent article.[25] Since our last communication with him, we have been able to add another five cases to our list (Cases 10, 11, 12, 13 and 14). Other Canadian cases have been reported by Gagné and Hould (three cases), Gerrard and Moore (two cases), Donohue (two cases), Hoogstraten and McLandress (one case) and McMillan and Hamperl (one case). The total number of all known Canadian cases, including ours, is now thought to be 23.

In the present paper we shall summarize the case reports of our three most recent cases (Cases 12, 13 and 14), compare their clinical picture with that of the older ones in our series, and try to correlate our findings with the pathological aspects of the disease.

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CASE REPORTS

CASE 12 (Table I).—The patient, a girl aged 2 months, was admitted to Ste. Justine Hospital on December 18, 1957, for gastro-enteritis. A considerable degree of dehydration was noted at the time of admission. On December 23, 1957, the child developed an abscess on the left thigh. The abscess was opened on December 26 by two surgical incisions, and pus and blood were evacuated. On January 1, 1958, however, another abscess formed on the right thigh. On January 15, cough appeared suddenly, followed by slight dyspnœa; however, the chest was completely clear on auscultation. Gradually dyspnœa became more and more intense so that on January 19, the child showed very marked respiratory distress and cyanosis, still however with total absence of abnormal auscultatory signs. On January 20, the child was in fairly satisfactory condition while in an oxygen tent, but cyanosis reappeared instantly when she was taken out of the tent. Temperature remained fairly constantly between 99° and 100° F., except once when 102° F. was noted. The child died in cyanosis and respiratory distress on January 20.

The following laboratory tests were performed during life: Stool (December 19, 1957): presence of *E. coli* 0127 B 8; numerous Candida; Salmonella and Shigella negative. Electrolytes (December 19, 1957): chlorides 107.3; sodium 132; potassium 2.41; calcium 5.23 mEq./l. Urine (December 20, 1957): slightly opaque; density 1010; reaction alkaline; bacteria ++++; leukocytes ++; epithelial cells ++; mucus +.

Blood counts	*Dec. 19, 1957*	*Dec. 27, 1957*	*Jan. 1, 1958*
R.B.C.	2,820,000	2,550,000	4,500,000
W.B.C.	3450	9300	9000
Hb	67.2%	46%	90.6%
Colour index	1.2	0.9	1.0
Neutrophils	34%	43%	48%
Monocytes	1%	4%	8%
Lymphocytes	63%	46%	42%
Eosinophils	2%	7%	2%
Thrombocytes	197,400	not counted	not counted
Reticulocytes	——	1.1%	——

X-ray examination of the lungs revealed a finely mottled appearance with peripheral emphysema (Fig. 1).

Autopsy report.—The body was that of a female child, 52 cm. in length and 3 kg. in weight. The skin was very pale. There was no pneumothorax, and a small quantity of serous liquid was found in the pleural spaces. Very marked bullous emphysema was present on the lung surfaces. The lung itself was congested, and of whitish-pink colour, showing here and there a bluish hue. It was firm on palpation, and on section the tissue was quite homogeneous and whitish-pink, not without a certain resemblance to hepatic parenchyma. On the left superior lobe, a small brownish elevated spot was found which, on subsequent histological examination, proved to be a capillary angioma.

On opening of the trachea and of the great bronchi a considerable quantity of thick yellowish material was found, causing a partial obstruction of the airways. The mucous surface of the bronchi was somewhat roughened and here and there even granular.

The histological picture of the rest of the lung was that of a typical *Pneumocystis carinii* pneumonia (Fig. 2). In some regions of the lungs there were typical hyaline pseudomembranes.

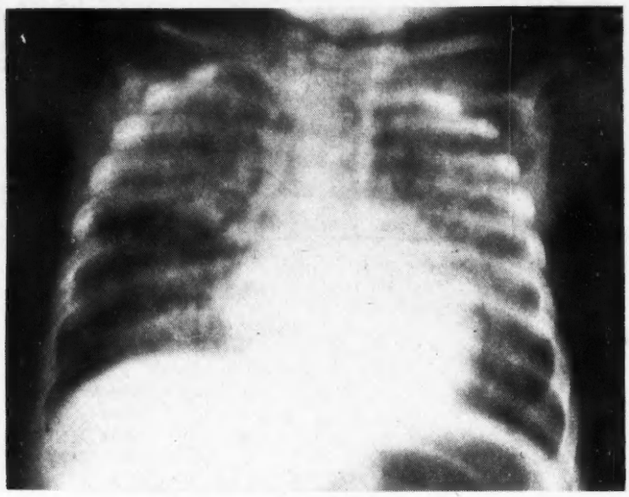

Fig. 1.—Chest radiograph of Case 12, showing finely mottled appearance of the lung parenchyma and presence of peripheral emphysema.

As regards the other organs, it is sufficient to note that there was a marked steatosis of the liver. No parasites were found in other organs.

CASE 13 (Table I).—The patient was an adopted child of female sex weighing 7 lb. 7 oz. (3.4 kg.) at birth. She was admitted to Ste. Justine Hospital on February 11, 1958, at the age of two months, for a dry, non-productive cough which had started about a week earlier. The cough was first paroxysmal in character and occurred several times a day, during which time the child seemed to suffocate. A symptom-free period of several days then followed, after which the cough reappeared and became so frequent that the child was in a constant state of suffocation and unable to take food by mouth. Temperature was normal all the time. On admission there were fairly severe cyanosis, an intense dyspnœa, some rhonchi over the left lung, and hypersonority over the right lung. Thoraco-synthesis to relieve possible intrapleural hypertension was attempted. This was followed by a subcutaneous emphysema. The radiograph taken at this time is reproduced in Fig. 3.

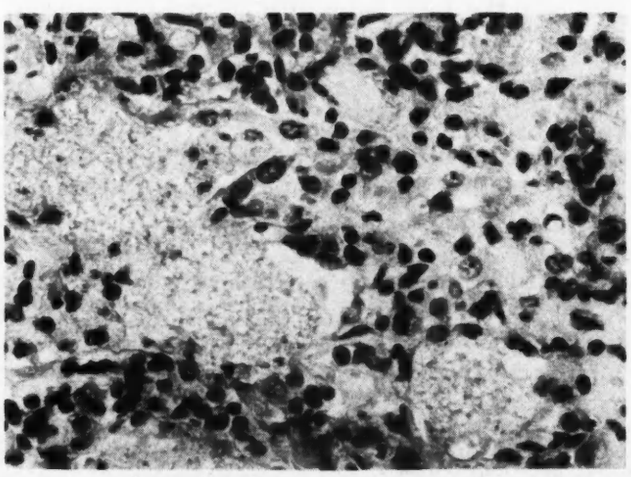

Fig. 2.—Histological preparation of the lung in Case 12, showing typical interstitial *Pneumocystis carinii* pneumonia with parasite-filled alveoli, Hæmalum-phloxin-saffron. × 500.

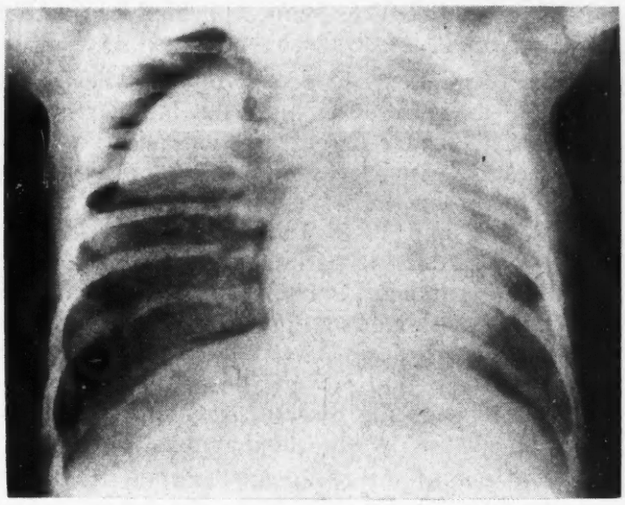

Fig. 3.—Chest radiograph in Case 13, showing a pneumothorax on the right side with marked consolidation of the right upper lobe. The right lower lobes and the left lung show the characteristic mottled appearance with peripheral emphysema.

The child died on the next day in deep cyanosis. Use of the oxygen tent did not seem to have any great effect on the course of the disease.

Autopsy report.—The body was that of a girl measuring 56 cm. in length and weighing 3.75 kg. On opening the thoracic cavity, a pneumothorax was noted on the right side. The surface of the right lung was covered by emphysematous bullæ, extending to the mediastinum and the pericardium. There was also bullous emphysema on the surface of the left lung. Both lungs, larger in size than normal, were very firm on palpation (especially the right superior lobe) and did not float on water. The surface of the lung parenchyma was pale pink and showed here and there bluish spots. Visceral pleura was smooth, and many small white-yellowish nodules, measuring from one to a few mm. in diameter, could be seen by transparency. On section, the gross appearance was the same except that in the consolidated portions there was marked "hepatization". Microscopically, the lungs presented a typical picture of *Pneumocystis carinii* pneumonia (Fig. 4).

No parasites were found outside the lung, and the pathological examination of other organs did not reveal any particular abnormalities. Their description is therefore omitted.

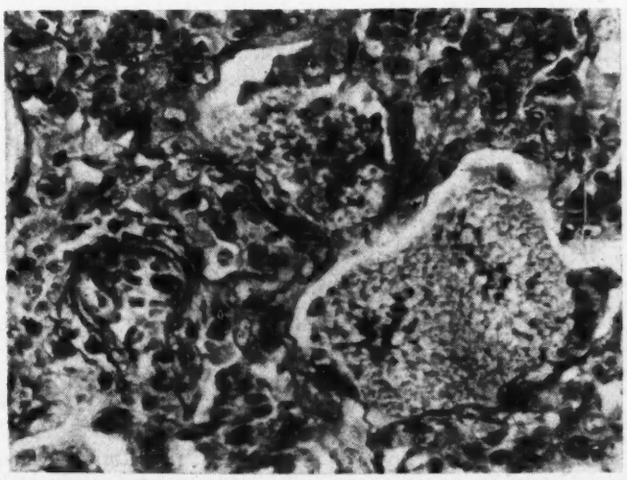

Fig. 4.—Histological preparation of lung, Case 13, showing typical *Pneumocystis carinii* pneumonia. Magenta after fixation in osmic acid (Marchi). × 500.

CASE 14 (Table I).—The patient was a boy, aged 2½ months, admitted to Maisonneuve Hospital for furunculosis, diarrhœa and athrepsia. Before admission, he developed a dry, non-productive cough, accompanied by anorexia and a certain degree of somnolence. Physical examination on admission revealed marked dyspnœa which was attributed to a left pneumothorax. Thoracosynthesis was performed and was followed by a marked remission of symptoms. However, two days later, the child died in cyanosis and respiratory distress.

At autopsy, typical Pneumocystis pneumonia was found. The histological picture of the lung is represented in Fig. 5. No *Pneumocystis carinii* was detected in other organs.

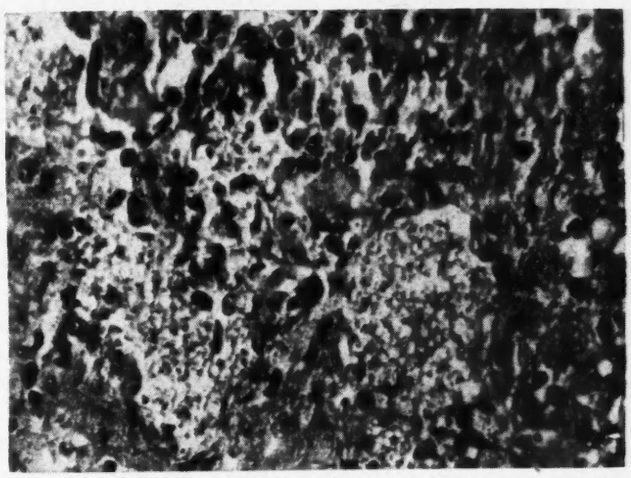

Fig. 5.—Histological preparation (Case 14), showing typical *Pneumocystis carinii* pneumonia. Masson's trichrome. × 500.

COMMENT

The three case histories presented reflect rather faithfully the clinical picture prevailing in the whole of our histologically proven series of 14 cases; from these the general features of the disease may be outlined as follows:

Both sexes are equally affected (7 males and 7 females in our series). Age incidence in our series lies between 2 and 4 months. Exceptionally, however, even adults may be affected (for example, the case of McMillan and Hamperl). The incidence of prematurity in our series approaches the 40% reported in the literature (Cases 1, 5, 6 and 7 were known to be prematures).

The role of debility (whether due to prematurity or to other causes) seems to be of major importance. In one of our cases (Case 5) this coexisted with a diffuse ulcero-purulent bronchitis, the *Pneumocystis carinii* pullulating among the purulent foci without even causing a characteristic plasma-cellular reaction (the only atypical case in our series). In another case (Case 4) *Pneumocystis carinii* pneumonia was associated with cytomegalic inclusion disease (Figs. 6 and 7). We will not speculate here on whether in this particular case the cytomegalic inclusion disease was responsible

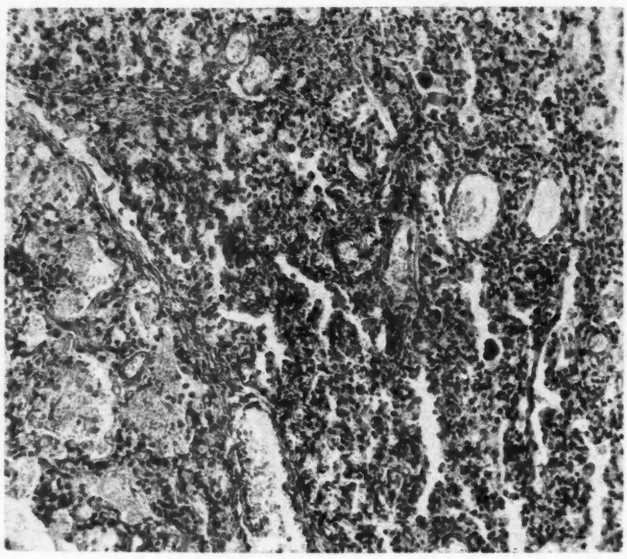

Fig. 6.—Histological preparation of lung (Case 4), showing coexistence of typical *Pneumocystis carinii* pneumonia (on left) and of typical cytomegalic inclusion disease (on right). Hæmalum-phloxin-saffron. × 125.

for the conditions necessary to the growth of the Pneumocystis, or whether the particular state of debility is equally necessary for the development of both diseases. To give a third example, in Case 12, the child may have been weakened by recurrent abscess formation and also by a pathogenic *E. coli* infection. One infant (Case 9) was debilitated by a central nervous system condition accompanied by spasmodic rigidity of all four extremities. One infant (Case 10) was suffering from pronounced thyroid deficiency, and another had diarrhœa and was suffering from furunculosis (Case 14).

The clinical picture is rather suggestive although by no means pathognomonic. The illness starts by a sudden onset of periods of dry, unproductive cough accompanied by signs of suffocation. Cyanosis and polypnœa are rather pronounced and there is marked sternal retraction. Oxygen usually brings relief, but symptoms recur as soon as it is discontinued. At no time is there a febrile state, except when the disease is complicated by another infection.

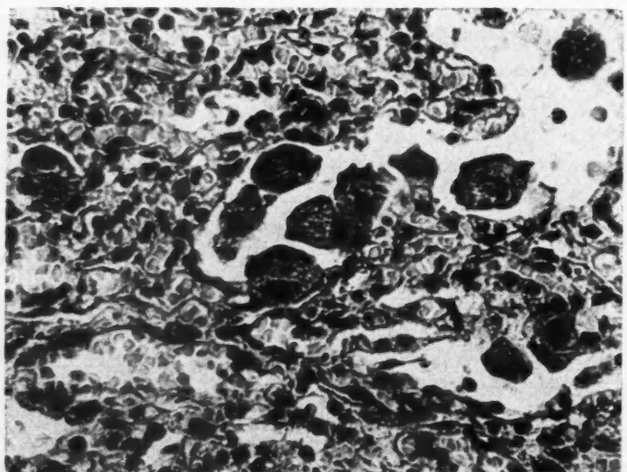

Fig. 7.—Detail of a region of the previous figure, showing typical cytomegalic inclusions. Hæmalum-phloxin-saffron. × 500.

Often there seems to be a symptom-free period of a few days' duration after the initial onset of the disease, which in our opinion merits special consideration. Such a symptom-free period was definitely present in seven of our cases (Cases 2, 3, 4, 6, 7, 8 and 12 in Table I). It may also be detected by studying certain case histories in the literature (Ammich, Gerrard and Moore, Gagné and Hould), although its significance did not attract the attention of the respective authors. Should the symptom-free period prove to be a common feature in the course of the disease, it would become a valuable tool for its clinical diagnosis.

In explanation of this phenomenon, the following hypothesis might be suggested. The initial period of suffocation may be caused by œdema and formation of hyaline pseudomembranes (especially well represented in certain regions of the lung of our Case 12), perhaps due to some sort of hypergic reaction. The disappearance of the exudate associated with pseudomembranes might then explain the remission of symptoms for a few days. This would be followed by new periods of suffocation which now, however, are due to the direct obstruction of bronchi and alveoli by masses of the pullulating Pneumocystis. In both periods of the clinical course of the disease, there would thus be a purely mechanical obstacle to adequate oxygenation. Further observations are necessary in order to evaluate the exact incidence of the "symptom-free period".

Spontaneous pneumothorax is not rare, our Cases 13 and 14 being good examples.

In uncomplicated cases, the auscultatory signs over the lungs are absent or nearly so.

White blood cell counts are variable and for this reason cannot be depended upon; often they may be quite high (18,850 in Case 7; 23,000 in Case 9; 28,000 in Case 11) but sometimes they may be surprisingly low (8900 in Case 8).

The x-ray picture of the lung does not permit differentiation from other conditions such as milk-aspiration pneumonia. All we can say in a typical case is that there is absence of air in certain (usually peri-mediastinal) regions of the lung parenchyma, accompanied by emphysema in other (usually peripheral) regions.

The question of epidemiology is still unanswered, and our series was of no help in this respect, as we were unable to trace any definite relations between our cases.

The disease is said to end fatally in about 40% of cases. This, it seems to us, is impossible to establish, for there is no way of making an absolutely positive diagnosis during life (except in cases where a needle biopsy of the lung is

performed*). The complement fixation test (Barta) has still to be perfected to give absolutely reliable results. Non-fatal cases certainly do exist, and it is left to the ability of clinicians to seek them out, to learn to make a positive diagnosis during life, and then of course to find a specific treatment.

SUMMARY

Clinical histories of our three most recent cases of *Pneumocystis carinii* pneumonia are commented on and compared with findings in the whole series of our 14 Canadian cases.

Correlation of clinical features and pathology of some aspects of the disease is attempted; the possible diagnostic importance of a commonly occurring symptom-free period of a few days after the initial onset of the disease is stressed.

I wish to thank Professor J. L. Riopelle for his kind interest in this paper and for his valuable advice in its preparation.

I am indebted to Drs. F. W. Wiglesworth, L. C. Simard, S. Lauzé and J. P. Thériault for offering me their cases to be added to this series.

ADDENDUM

Since this paper was submitted for publication, we have autopsied still another typical case at Ste. Justine Hospital, that of a boy who died on June 24, 1958, at the age of 2½ months. This brings the number of cases in our personal series to 15 and that of all officially known Canadian cases to 24.

It appears then that the disease is much more common in this country than has been thought, and we have only to open our eyes to see it.

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RÉSUMÉ

Les histoires cliniques de nos trois derniers cas de pneumonie à Pneumocystis sont commentées en comparaison avec celles de notre série entière de 14 cas canadiens.

Une corrélation anatomo-clinique de certains aspects de la maladie est tentée, en soulignant l'importance diagnostique possible de la fréquence d'une période asymptomatique de quelques jours qui suit le déclenchement initial de la maladie. G.B.

*Needle biopsy of the lung appears at present to be the only possible way of establishing a positive diagnosis of the disease during life. However, this method is not yet universally accepted and is not performed at Ste. Justine Hospital.

OPERATION FOR CARCINOMA OF THE PANCREATIC BODY AND TAIL

Kibler and Bernatz (*Proc. Staff Meet. Mayo Clin.*, 33: 247, 1958) have recently studied 175 cases of primary carcinoma of the body and tail of the pancreas, operated on at the Mayo Clinic, 1920-1956. Of these 158 were cases of adenocarcinoma, six cases of papillary cystadenocarcinoma, and 11 cases of malignant islet cell lesions. This represents 18% of all malignant lesions of the pancreas coming to operation.

Men were afflicted twice as commonly as women. Pain was the most common symptom, and 82% mentioned pain as an initial symptom. The pain was usually epigastric but in over half the cases extended to the back; it was characteristically aggravated by lying down, and it tended to become constant. Anorexia, dyspepsia and nausea were common; jaundice and phlebitis were late findings. Physical examination was of limited value, except for the ominous cachexia, and a palpable mass in about 40% of cases. No laboratory test was of consistent diagnostic value, and positive x-ray evidence was rare. In fact, the preoperative diagnosis was seldom made with certainty, and in many cases the early impression was of functional disorder only.

Prognosis was very poor, for only an occasional lesion was resectable (7 out of 158 cases), and the average survival for the whole series was three and a half months after operation. Nobody was cured.

Early abdominal exploration when the clinical picture is at all suggestive of carcinoma of the pancreatic body or tail is essential.

AMINOPHYLLINE POISONING IN CHILDREN*

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PHYSICIANS GENERALLY and general practitioners, pædiatricians and allergists in particular are aware of the therapeutic value of aminophylline (theophylline ethylenediamine) in the management of bronchial asthma. However, less widely known, discussed or even recognized is aminophylline poisoning arising from therapeutic use. This paper presents 10 cases of aminophylline poisoning from the records of the Montreal Children's Hospital, with a brief note on the pharmacology of the xanthines, analysis of cases and recommendations.

CASE 1.—This was a 3-year-old child weighing 11.4 kg. on admission. She had received 15 grains (900 mg.) of aminophylline in 24 hours by suppository (40 mg./kg. body weight) *stat*, and repeated once on the same day. No other drugs were involved.

The history was that of an acute asthmatic attack with vomiting starting on the morning of the day before admission. That afternoon the patient was started on aminophylline by suppository, and some hours later the vomitus became dark brown in colour. Twelve hours before admission the patient developed irritability alternating with drowsiness, and seven hours before admission was staggering as though intoxicated. On admission the rectal temperature was 100° F., and the child was irritable and staggering, with excitement alternating with drowsiness. Treatment consisted of intravenous fluids and rectal paraldehyde. The response was good, with no further vomiting. The urine was normal. Oral fluids were taken well in 18 hours, and the patient was discharged within 24 hours.

CASE 2.—This was a 3½-year-old girl weighing 14.5 kg. She had received aminophylline suppositories, although the dose of aminophylline per suppository could not be determined. No other drugs had been administered.

The history was that there had been wheezing two days before admission, and that she had been given one aminophylline suppository. One day later she started vomiting. Vomitus became black the next day. On admission she appeared acutely ill, drowsy and dehydrated, and was still vomiting black material. She was treated with intravenous fluids and antibiotics, and the response was fairly good. The intravenous fluids were discontinued in three days and antibiotics were discontinued in five days. There is no urinalysis on record. She was discharged on the sixth hospital day.

CASE 3.—This 3-year-old boy had received 7½ grains (450 mg.) of aminophylline by suppository. This dose had been repeated 12 hours later. He had also been given some undetermined medication by injection and in liquid form.

The history was that of an upper respiratory infection of several days' duration, with wheezing on the day before admission, for which he had been given two aminophylline suppositories. He vomited blood on the morning of the day of admission. At physical examination on admission he was excited and mildly dehydrated, with evidence of recent hæmatemesis. He was put only on intravenous fluids and sedation. Within 12 hours he showed marked improvement, and the infusions were discontinued. He took a soft diet well without vomiting. Initial urinalysis showed 200 mg. % of albumin. He was discharged on the second hospital day.

CASE 4.—This 3½-year-old girl had received 3¾ grains (225 mg.) of aminophylline by suppository every six hours for seven doses. She had also received penicillin and streptomycin.

The patient was admitted with laryngo-tracheobronchitis. She was given streptomycin and aminophylline. Shortly after this she started vomiting. This persisted and the vomitus became bloody. Aminophylline was eventually discontinued, but hæmatemesis continued and she developed nuchal rigidity. The cerebrospinal fluid was normal. At first there was irritability, followed by marked drowsiness and coma. There was no dehydration or electrolyte imbalance, nor was there albuminuria. She was treated with intravenous fluids and responded slowly. She was discharged on the eighth hospital day with good recovery.

CASE 5.—This 4½-year-old boy, weighing 18 kg., had received 3¾ grains (13 mg./kg. body weight) of aminophylline by suppository. He had also received adrenaline subcutaneously and a cough syrup.

The history was that of a chronic asthmatic treated intermittently with aminophylline and ephedrine for the past few years. The history of the illness which resulted in his admission is not reliable, especially with reference to medications. He was treated at home for seven days with adrenaline, a cough mixture, and aminophylline for his asthma. Allegedly he had been given only one aminophylline suppository six days before admission. Two days later he had vomited several times, and hæmatemesis had started on the same day. On admission he was acutely ill, with bilateral pneumonia and dehydration. He was treated with antibiotics and only intravenous fluids. He responded slowly and was not unusually drowsy or irritable. The second urinalysis showed 240 mg. % of albumin. He was discharged on the 11th hospital day.

CASE 6.—This boy aged 2 years and 8 months and weighing 12 kg. had received aminophylline suppositories of undetermined strength every four hours over a questionable period of time. He had also received ephedrine and codeine.

The history was that of asthma with left lower lobe pneumonia, treated with aminophylline suppositories every four hours. He vomited but there was no hæmatemesis. He was seen in the clinic about 24 hours after the onset of respiratory distress, and was noted to be extremely restless and irritable. Initial urinalysis showed 20 mg. % of albumin. He responded slowly to antibiotics, intravenous fluids and sedation. He was discharged well in seven days.

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CASE 7.—This 16-month-old girl, weighing 8.2 kg., had received 2 grains (120 mg.) of aminophylline by suppository every four hours for four doses, and some Terramycin (oxytetracycline HCl).

The child was admitted *in extremis* with asthma and pneumonia. She was given 2 grains (120 mg.) of aminophylline every four hours for four doses. Within 24 hours she was dehydrated, became increasingly restless and vomited blood. The restlessness increased, she developed convulsions, and the urine was noted to be milky in colour. She improved slowly on rehydration and sedation, and was discharged on the 14th hospital day.

CASE 8.—This 8-month-old girl, weighing 8 kg., had been given a total of 10 grains (600 mg.) of aminophylline by suppositories in 24 hours (41 mg./kg. body weight) *stat* and repeated once on the same day. She had also received penicillin, eye drops and sulfadiazine.

Four days before admission she had been treated with intramuscular penicillin and eye drops for an upper respiratory infection with conjunctivitis. On the day of admission she had been given aminophylline suppositories and sulfadiazine. By late afternoon she developed extreme irritability without vomiting. She was admitted to hospital and treated with forced fluids by mouth. The irritability subsided overnight. The child was normal the next morning. Initial urinalysis showed a trace of albumin. There was no vomiting or dehydration, and the child was discharged in 24 hours.

CASE 9.—This 10-year-old boy weighed 31 kg. The history was that of fever and respiratory distress which had started a day before admission. He had previously been treated as an asthmatic and given 7½ grains (450 mg.) of aminophylline in a single intravenous dose. Shortly afterwards the pulse had been found to be very slow and weak, and the blood pressure subnormal. Fifteen minutes later he had vomited, but there had been no hæmatemesis. On admission to hospital his temperature was 100.6° F., pulse 140, respirations 32, and blood pressure 110/70 mm. Hg. The chest was hyperresonant throughout, with scattered moist rales over both lungs and a prolonged expiratory phase. Hæmoglobin was 11.4 g., white blood cell count 8600 per c.mm., and urine normal. In hospital he was treated with antibiotics and antihistamine with good response. He was discharged well on the third hospital day.

CASE 10.—This 3-year-old boy, weighing 14 kg., had been perfectly well up to a day before admission, when he had developed a non-productive cough. The next morning he had had dyspnœa with asthmatic breathing. He had been given aminophylline per rectum at 10 a.m. and again at 2 p.m. Shortly after he had been given the second suppository the dyspnœa was relieved, but he had developed severe vomiting. This had persisted, the vomitus eventually becoming a brownish colour. Examination at the time of admission showed that he was afebrile, not dehydrated, in no respiratory distress, but vomiting. A few hours later he appeared quite dehydrated and acidotic. He was treated with intravenous fluids only and antibiotics, and did very well. He was discharged well on the sixth hospital day.

DISCUSSION

Before analyzing the cases presented, it would seem worth while to discuss briefly the pharmacology of the xanthines and the clinical manifestations of aminophylline intoxication, and to comment briefly on the pathology of aminophylline poisoning.

Caffeine, theophylline and theobromine are methylated xanthines, and aminophylline is 78% theophylline and 12% ethylenediamine. Ethylenediamine combined with theophylline makes it more soluble and more completely absorbed. All the xanthines have similar pharmacological actions and differ only in intensity, theophylline being the most active of the three. The xanthines stimulate the central nervous system, augment gastric secretions, cause diuresis and exert central and peripheral actions on the cardiovascular system. These actions are generally antagonistic and the results are variable. There may be bradycardia or tachycardia, and a slight rise or fall in blood pressure, depending on which action predominates. Therapeutically, aminophylline causes relaxation of the smooth muscles of the bronchi. When the drug is administered to patients with bronchial asthma there is a definite increase in vital capacity. The effects of aminophylline are cumulative and act synergistically with ephedrine. An appreciable degree of tolerance may develop to certain effects of the xanthines, except to those on the central nervous system.

The clinical manifestations of aminophylline overdosage may be: (1) Central nervous system stimulation, with unusual restlessness and irritability. This is an early sign and may progress to tremors, epileptiform convulsions, drowsiness and coma. (2) Prolonged increase in gastric secretion, manifested by nausea, persistent vomiting or even hæmatemesis. (3) Increased urine output, often with reversible albuminuria and dehydration. (4) Cardiovascular collapse or even death.

Very little has been written on autopsy findings in aminophylline poisoning, and no deaths have occurred from it at the Montreal Children's Hospital. In a recent review of the literature, McKee and Haggerty[2] show a mortality rate of five in 35 cases. Nolke[3] reports four deaths in a series of 13 cases, all four showing pulmonary inflammatory changes with ulcerative œsophagitis and perforation in two.

Textbook reference for guidance in oral, rectal and intravenous use of aminophylline in children is unsatisfactorily stated as "1-3 grains (60-180 mg.) orally"[4] and "1½-4 grains (90-240 mg.) rectally".[5] Other references are more vague, some presumably for adults.

Concentration of the drug in the blood is maximal in about one hour after administration of plain oral tablets, and in about five hours with enteric coated tablets. After rectal administration blood levels are maximal between three and five hours, although absorption is variable and unpredictable.[6]

ANALYSIS OF CASES (see Table I)

The 10 cases presented are those of therapeutically induced aminophylline poisoning observed at the Montreal Children's Hospital over a period of five years, and illustrate the more usual clinical course of aminophylline poisoning in children. Eight of the 10 cases followed administration of aminophylline by the rectal route. In one case the drug was administered intravenously, and in one case the route of administration was not ascertained. Frequency of dosage ranged from a single suppository to one suppository every four, six, eight or twelve hours. Total known dosage ranged from 3¾ grains (225 mg.) for a 4½-year-old child to 22½ grains (1350 mg.) in 36 hours for a 3½-year-old asthmatic child. In four cases the total dosages were not determined.

TABLE I.

Sign-symptom	*Case* 1	2	3	4	5	6	7	8	9	10	*Incidence*
Vomiting	X	X	X	X	X	X	X		X	X	9/10
Hæmatemesis	X	X	X	X	X		X			X	7/10
Irritability	X		X	X		X	X	X			6/10
Dehydration		X	X		X	X	X	X			6/10
Albuminuria			X		X	X	X	X			5/10
Drowsiness	X	X		X			X				4/10
Convulsions							X				1/10
Cardiovascular syncope									X		1/10

Irritability, vomiting, hæmatemesis and dehydration were nearly always present, and complicated the pre-existing disease for which the drug was administered.

COMMENT

On the basis of past experience, the department of allergy of the Montreal Children's Hospital recommends the following dosages in the use of oral and rectal aminophylline in the treatment of bronchial asthma in children:

(a) Oral suspension tablets: 5 mg. (1/12 grain) /kg. of body weight; the dose may be repeated every eight hours, but not oftener than every six hours.

(b) Rectal suppository or retention enema: 7 mg. (⅛ grain)/kg. body weight. The dose may be repeated every eight hours, but not more often than every six hours, and is to be restricted to cases where oral administration is not practicable.

This department has not encountered any undesirable effects with this regimen, which has been found adequate for treatment of asthmatic children, exclusive of those in status asthmaticus. Other authorities are in accord with this schedule.[2, 7]

The injudicious use of drugs is deprecated and considered dangerous; it is all the more so when they are combined. This applies particularly to ephedrine, since the effects of ephedrine overdosage resemble closely those of aminophylline poisoning, and there is evidence that ephedrine acts synergistically with aminophylline.[3] Aminophylline, either alone or in combination with other drugs, should be prescribed as "grains or milligrams per tablet" and "grains or milligrams per suppository", and not as "aminophylline tablets" or "an aminophylline suppository". Specified intervals for repeating the dose should be definitely stated. In this connection it might be worth mentioning that suppositories are usually difficult to cut in half without shattering, and the drug may also be unevenly distributed throughout the suppository. There is now a one-grain suppository on the market, as well as an oral suspension with a concentration of one grain of the drug per teaspoonful.

The early recognition of aminophylline poisoning, often difficult, may prevent severe morbidity, or even death. It is well for all concerned to be aware of the early signs and symptoms of this condition, manifested in particular by unusual irritability, excitement and vomiting. There is no antidote, and prevention is the best treatment.

Treatment of the intoxication is purely symptomatic, aimed at sedation, support of respiration and circulation, and the prompt prevention or correction of dehydration.

The question of idiosyncrasy versus intoxication is far from settled, and is not dealt with in the literature. It is fairly safe to assume that there are many more children who get overdosage of this drug and who do not become intoxicated, than there are who do show the effects of overdosage. As White and Daeschner[7] pointed out, many factors influence the final effects of the drug, particularly the degree of incapacity caused by the original illness under treatment. Review of the literature shows that in all cases reported, dosage was too high, judged by our standards, indicating overdosage rather than hypersensitivity as being causative. However, we know of only one case[8] where individual susceptibility must be incriminated. This child, weighing 12.5 kg., received a single one-grain (60 mg.) suppository of theophylline. Within five hours he developed persistent vomiting, with flecks of blood in the vomitus, and was moderately dehydrated. The patient recovered within 24 hours with oral rehydration.

SUMMARY

A series of 10 cases of aminophylline intoxication, due to the administration of relatively large doses of

the drug, is presented. A brief résumé of the pharmacological action of the xanthines, and the signs and symptoms of aminophylline poisoning, are presented. Some recommendations for guidance in the use of aminophylline are enumerated, in the hope that this communication will aid in the judicious use of this valuable drug, and eliminate preventable intoxication, iatrogenic in nature.

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RÉSUMÉ

Les dangers que présente l'emploi de la théophylline combinée à l'éthylène-diamine chez les enfants sont illustrés par les faits cliniques de dix cas d'intoxication relevés dans les archives de l'Hôpital des Enfants de Montréal. L'aminophylline est surtout employée dans l'asthme bronchique où elle augmente sensiblement la capacité vitale. Ses effets sont cumulatifs et renforcés par l'éphédrine. Les manifestations cliniques d'intoxication comprennent de l'irritabilité et de la nervosité, des nausées, des vomissements et même de l'hématémèse, une augmentation du débit urinaire et enfin un collapsus cardiovasculaire qui peut aller jusqu'à la mort. Afin d'éviter ces complications, les auteurs préconisent l'emploi de la posologie adoptée à leur hôpital et qui s'établit à 5 mg./kg. de poids corporel aux huit heures pour la voie orale ou 7 mg./kg. de poids corporel, également aux huit heures, pour la voie rectale. Bien qu'il n'existe aucun antidote spécifique il est important de reconnaître les signes d'intoxication dès leur premières manifestations et d'établir au plus tôt une thérapie de soutien. Le traitement consiste en un rétablissement de l'équilibre hydrique, le maintien de la respiration et de la circulation, et l'administration de sédatifs.

A CLINICAL RE-EVALUATION OF MASTER'S TWO STEP TEST*

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ONE OF THE MOST difficult problems facing any physician is the evaluation of atypical chest pain in middle-aged men and women. Very often the physical examination and resting electrocardiogram are normal, or the electrocardiogram may show minor ST and T wave changes which are not diagnostic. Some form of exercise test may then be resorted to in order to elicit signs of myocardial ischæmia. Probably the most commonly used test is Master's two step test which was described in 1942.[1] Its particular virtue lay in Master's attempt to standardize the test, i.e. to impose roughly similar levels of work on persons of varying age, sex and body weight. Master's original tables were the result of more than 2000 tests performed at Cornell University Medical College between 1925 and 1929 on normal persons of all ages and both sexes. They were constructed on the basis that blood pressure and pulse rate should return to within 10 points of resting levels two minutes after cessation of exercise. However, in 1953, Master's group published additional data on 311 normal individuals and it was obvious that the original tables were not adequate.[2] Among 286 normal subjects with a normal electrocardiographic response the pulse rate or blood pressure had not returned to resting levels within *five minutes* after the single step test in 14%, and in 24% after the double step test. Furthermore, it was of interest that of the 311 normals studied, only 75 (30.5%) were over 40 years of age. On the basis of experience, Master *et al.* suggested that any ST segment depression greater than 0.5 mm. should be considered abnormal after exercise.[1] Using this basic criterion, they reported in 1942 no positive tests in 65 normal adults over 40 years of age. In the larger study reported in 1953, there were 3.2% positive tests after the single test, and 7.1% positive tests after the double test.[2] These criteria obtained from relatively young control groups are not suitable for evaluating the great majority of patients studied, who are in the group over 40 years of age.

In two studies published in 1953 and 1956 Simonson[4, 5] made an exhaustive study of the normal electrocardiographic range of response to a standard exercise. He was particularly interested in the effect of age and weight in conditioning the exercise response. There was a definite difference in response when age was considered. For example, middle-aged men showed a greater increase in heart rate, or a slower recovery, or both, following exercise—an index of their poor state of physical fitness. The ST in V_5 was –0.46 mm. ± 0.50 mm. in the young group, as compared with –0.75 mm. ± 42 mm. in the older group. To put it another way, the 95% confidence limit would be –1.46 mm. as compared with –1.59 mm. in the older group. In addition the axis shifted slightly to the left in the younger group, as compared with a considerable (12.53°) shift to the right in the older group. Similar responses were noted by Silver and Landowne[6] in studying 60 males 20-80 years of age. They noted that the oldest group evinced comparatively delayed recovery of heart rate, and greater reduction in QT during and immediately after exercise. A greater *depression of ST* and

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diminution of T occurred with age. Recently Simonson[5] has published data on 91 healthy males whose average age was 56 years (50-60 years). They were studied after stepping up and down a 12 inch step at a rate of 19 ascents per minute for a total of 47 ascents in 2½ minutes. The single step was introduced to obviate the necessity of turning (as in Master's test), and it was calculated that the total lift lay between Master's single and double step test. The "normal" 95% limit for STII depression was found to be –1.0 mm. and for depression of STV_4, –1.3 mm. (rounded to –1.5 mm.), which is greater than the limits suggested by Master. Similarly, the T limits would be –1.6 mm. in II and –4.3 mm. in V_4. Also in this study Simonson showed that there was surprisingly little change in the electrocardiogram when relative overweight and underweight groups were compared. The same was true for absolute body weight. He concluded that no corrections for absolute body weight were indicated at present.

I believe that most clinicians who routinely use the Master test have already arrived at the conclusion that Master's original criteria would result in many false positive tests. In fact, in 1944, Master and his associates[3] reported that seven out of eight patients with "neuro-circulatory asthenia" gave positive tests. They offered the explanation that "the small, or hypoplastic heart sometimes found in such a person is constitutionally inadequate to carry on exertion".

Mazer and Reisinger[7] studied two groups of healthy subjects, one young with an average age of 28 years, and one older with an average age of 46. Subjects were encouraged to make as many trips across the Master stair as they could in 1½ minutes. Mean performance of the older group was 35.2 trips, which was 85% that of the younger group. The total work was comparable to a "double Master's" test but was performed at *twice the rate.* ST depressions exceeding 0.75 mm. occurred in 80% of the older group and 32% of the younger.

Twiss and Sokolow[8] also used the Master stair, but exercised their subjects to the point of fatigue, dyspnœa or pain. In their 100 controls, 73 instances of ST deviation were noted. However, from their paper it is impossible to tell how many exceeded Master's limit of 0.5 mm. They found that after exercise no normal subject developed or exceeded ST deviation of 1.0 mm. in lead I, 1.5 mm. in lead II or 2.0 mm. in V_4.

Of more value from our point of view is the study of Leeds and Kroopf[9] reported in 1953. They studied 595 airline employees, all male, of whom 283 were over 40 years of age and 243 under 40 years of age. A group of 69 women under age 35 was also studied. A double Master test was done and Master's criteria were applied. Ten men under 40 (all perfectly normal on examination) gave a positive Master's test (*4.3%* of 232 men). One man over 40 gave a positive test (0.6% of 169). However, six out of 69 healthy young women (or 8.7%) under age 35 also gave a positive test. None of the women in this group showed evidence of neuro-circulatory asthenia, unusual emotional reactions, anæmia or "other extracardiac factors" which might cause false positive results. They concluded that ST depression of 1.0-1.5 mm. would be a better index of coronary disease and lead to few false positive results.

As a result of these and other studies, there are almost as many sets of standards for judging exercise tests as there are investigators in the field. Table I lists only a few of the sets of criteria which have been suggested.[2, 5, 11, 12]

TABLE I.

	Criteria of positivity
Master	1. Depression of RST segment over 0.5 mm. in any lead. 2. Change from upright T to isoelectric or inverted T in any lead except lead 3. 3. Development of arrhythmias or change from normal to abnormal conduction. Development of abnormal q.
Unterman and DeGraff	1. Depression of ST segment greater than 1.0 mm. in leads 1, 2, 3, or greater than 0.75 mm. in CF_4. 2. Conversion of an upright T to an isoelectric or inverted T in 1, 2, or CF_4. 3. Disturbances in rhythm, premature systoles or runs of coupling.
Simonson	1. Depression of ST segment of 1.0 mm. or more in lead 2, and of 1.5 mm. or more in V_4.
Klakeg	1. Depression of ST segment of 2.0 mm. or more in any lead. Depression of greater than 1.0 mm. but less than 2.0 mm. regarded as equivocal. 2. Complete reversal of T in a left precordial lead.

I would like to present an analysis of 131 Master tests carried out in our ECG Department. The technique as outlined by Master was faithfully adhered to. Single or double tests were carried out after due clinical consideration. Our material has been divided into four categories. Group A consists of cases with a clear-cut history of angina pectoris, with normal or equivocal resting electrocardiograms, where electrocardiographic verification of the diagnosis was desired. We do not ordinarily encourage Master tests in this type of case. Group B consisted of patients with an atypical history but suspected of having angina. Group C were patients with a miscellaneous collection of chest pains which were not considered to be anginal in character. Group D consisted of patients without pain in whom tests were done for a variety of reasons. Some were done because of minor abnormalities in the electrocardiogram, some for military or insurance purposes, some to "exclude" heart disease at the request of the attending physician. Table II summarizes all our data on these 131 tests. Groups A and B gave closely similar results, with a high score of positive Master tests (57.7 and 51.7%). Group C gave the surprisingly high figure of 30.2% positives, and Group D 18.2%. Application of stricter criteria reduced the positive tests quite considerably. The angina

TABLE II.—DISTRIBUTION OF POSITIVE TESTS IN ALL SUBJECTS

Group	*Number*	*Master*	*Simonson*	*Klakeg*	*MSK*	*MS*	*MK*
A. Angina	26	15 (57.7%)	7 (26.9%)	5 (19.2%)	3	4	2
B. Possible angina	29	15 (51.7%)	5 (17.2%)	2 (6.9%)	2	0	3
C. Chest pain, not angina	43	13 (30.2%)	5 (11.6%)	2 (4.6%)	2	3	0
D. No chest pain, miscellaneous	33	6 (18.2%)	1 (3.3%)	1 (3.3%)	1	0	0
Total	131	49 (37.4%)	18 (13.7%)	10 (7.6%)	8	7	5

group was cut from 57.7% positive on Master's criteria to 26.9% positive on Simonson's criteria. However, even with these more rigid criteria there were still five positive tests in Group C (11.6%).

Elimination of all individuals with manifest heart disease or abnormal resting electrocardiograms did not substantially change these figures (Table III). Using Master's[2] criteria, we still got a 30% positive result in Group C. With Simonson's[5] criteria, Group C positives were cut to 10.8% and Group D to zero. Even with Klakeg's[11] criteria there were still two positives (5.4% in Group C).

It would seem, therefore, that even the most exacting criteria now in use will not entirely eliminate positive tests in patients who give no history of angina. Here indeed lies the hub of the problem. Since we have no independent method of knowing whether coronary insufficiency exists, other than by the clinical picture of angina, the clinical criterion must be paramount. A recent study by Lepeschkin[13] has suggested some ways in which false positive Master tests in normal subjects may be differentiated from true positive tests in subjects with coronary insufficiency. They stress the importance of projecting the PR segment to intersect with the ST junction in order to determine accurately the degree of ST junction-segment depression. Failure to do this may introduce a potent source of error with rapid rates, where the PR slopes downward as a result of superposition of the P wave on the U wave or by a downward course of the PT_a segment, and may cause the ST segment junction to appear lower than the level of the PR interval even in the absence of true ST segment depression. Application of this simple correction in their data reduced the number of false positive tests in their normal subjects from 26 to 16%. They found a high incidence of false positive tests in women over age 40 and in persons with past or present hypertension. Other features of the false positive response were: (a) a lesser depression of the ST segment (< 0.75 mm.); (b) depression of only a part of the ST segment ($< \frac{1}{2}$ the QT interval); (c) inversion of T waves confined to leads II, III or V_4 to V_6 and not accompanied by significant ST segment depression; (d) ST-T abnormalities which did not begin immediately after exercise and persisted less long than in true positive tests. Using these findings they were able to set up a combination of criteria which gave the least amount of overlapping, being present in 94% of the true positive tests and in only 23% of the false. Perhaps the development of some new and independent index of coronary insufficiency may eventually enable a more accurate judgment of this problem. For the present it is advisable to use criteria such as Simonson's[5] based on a large experience of normal responses to exercise, and which eliminate most patients who give no history of angina pectoris or suspicion of it. Careful evaluation of the record as proposed by Lepeschkin[13] should also be practised. With Master's criteria too many false positive tests occur, and the social and economic consequences of close adherence to these criteria must be very drastic indeed.

A few additional observations may be made from this study. The occurrence of pain during the exercise had variable diagnostic value. When it occurred in subjects in Group A who gave a history of angina, it was associated with a positive Master test. Pain occurred in 10 subjects out of 26 in Group A. In Group B six subjects out of 29 had pain, but only three out of six had positive Master tests. Two subjects in Group C complained of pain; neither had a positive test. One patient in Group D had pain and a positive Master test. In summary, then, patients with a history of angina who develop pain on exercise have a very high percentage of positive tests. Pain is much less common in the other groups and in them is just as likely as not to be associated with a negative test.

We have examined our subjects in Group D with special reference as to why a Master test was done. In 14 out of 33 instances it was done because of minor electrocardiographic abnormalities. Only one positive test was obtained in this group. Our data would suggest that there is very

TABLE III.—SUBJECTS WITH CLINICALLY NORMAL HEARTS, AND NORMAL OR EQUIVOCAL ECG

Group	*Number*	*Master*	*Simonson*	*Klakeg*	*MSK*	*MS*	*MK*
A. Angina	16	9 (56.2%)	4 (25.0%)	4 (25.0%)	2	2	1
B. Possible angina	23	12 (52.2%)	5 (21.7%)	1 (4.3%)	2	0	2
C. Chest pain, not angina	37	11 (30.0%)	4 (10.8%)	2 (5.4%)	2	2	0
D. No chest pain, miscellaneous	28	3 (10.7%)	0	0	0	0	0
Total	104	35 (33.6%)	13 (12.5%)	7 (6.7%)	6	4	3

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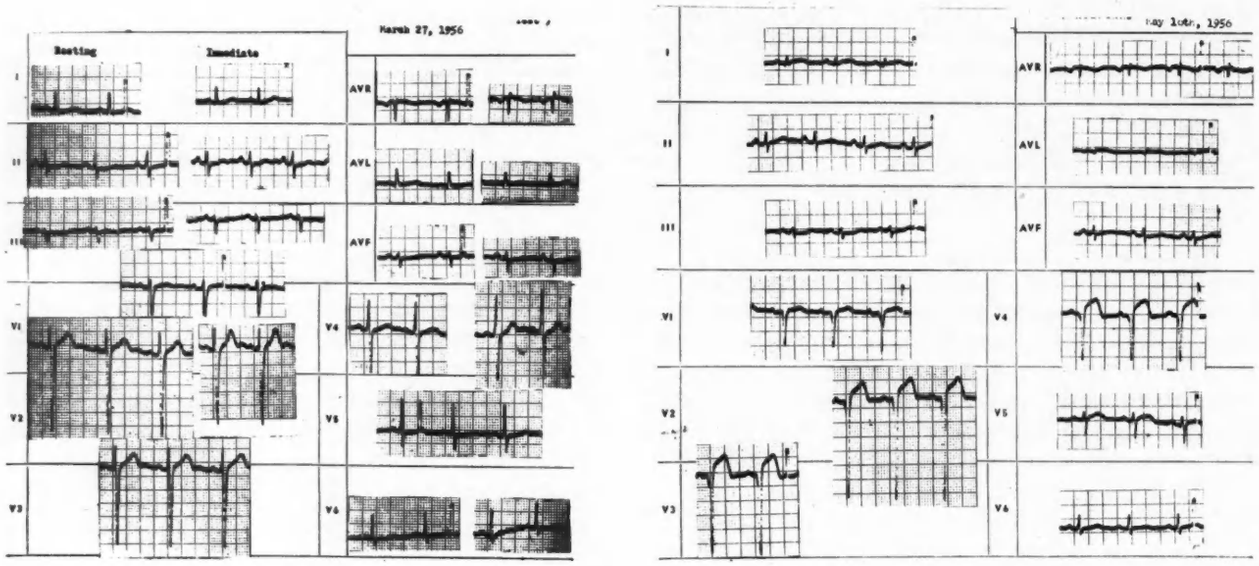

Fig. 1

little point in doing Master tests unless there is a reasonable suspicion of angina on clinical grounds.

I would next like to illustrate my thesis with some selected cases.

CASE 1 (Fig. 1)

The patient was a 51-year-old man who gave a history of pain along his right costal margin following a car accident in which he had been hit by the steering wheel. There was no angina. Diabetes had recently been discovered and was mild. His blood pressure was 150/85 mm. Hg. His resting electrocardiogram was a borderline curve and his Master test was negative. He was readmitted three months later complaining of a dull jabbing substernal chest pain—intermittent in character with malaise, fever and sweatiness. He had felt faint and dizzy for several days. Blood pressure was 95/60 and his electrocardiogram showed an acute anteroseptal infarction.

CASE 2 (Fig. 2)

The patient was a man aged 58 who two months before admission developed pressing retrosternal pain while walking, which was relieved by rest. One brother had died of heart disease at age 45. Blood pressure was 120/80 mm. Hg. His resting electrocardiogram (Fig. 2a) was normal and a Master test showed equivocal changes. Twice during the following month he had severe attacks of pain—"tearing" pain with radiation between the shoulder blades which lasted several hours. A record obtained during an attack of pain, and while the subject was on Danilone (phenindione) with a prothrombin time of 28 seconds, shows clear-cut evidence of coronary insufficiency (Fig. 2b).

In both cases the Master test failed to give a positive response in the face of a picture of impending myocardial infarction.

CASE 3 (Fig. 3)

The patient was a 37-year-old woman who complained of a sharp pain under the left breast with radiation to the back, associated with palpitation. Her examination was negative except for a blood pressure of 160/95 mm. Hg. Her resting electrocardiogram was within normal limits. A Master test was done and

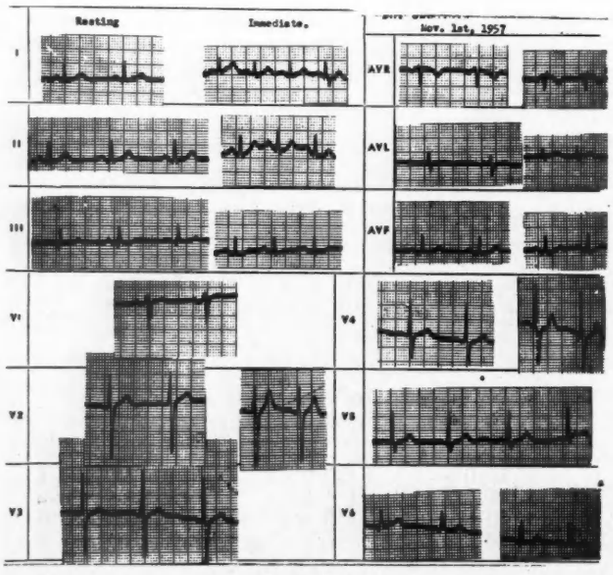

Fig. 2a

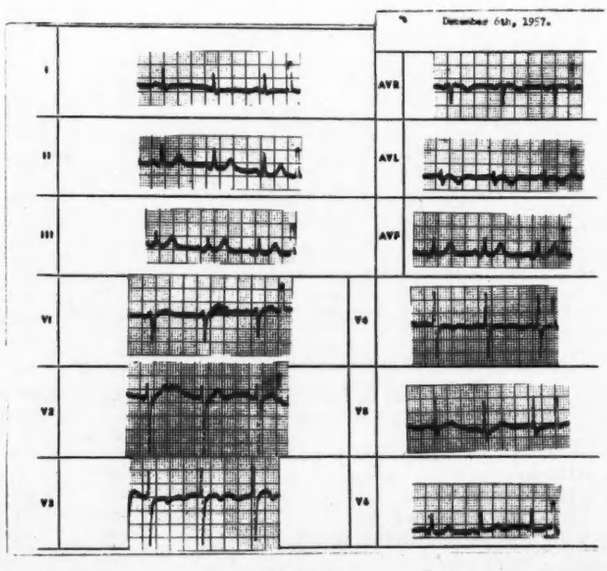

Fig. 2b

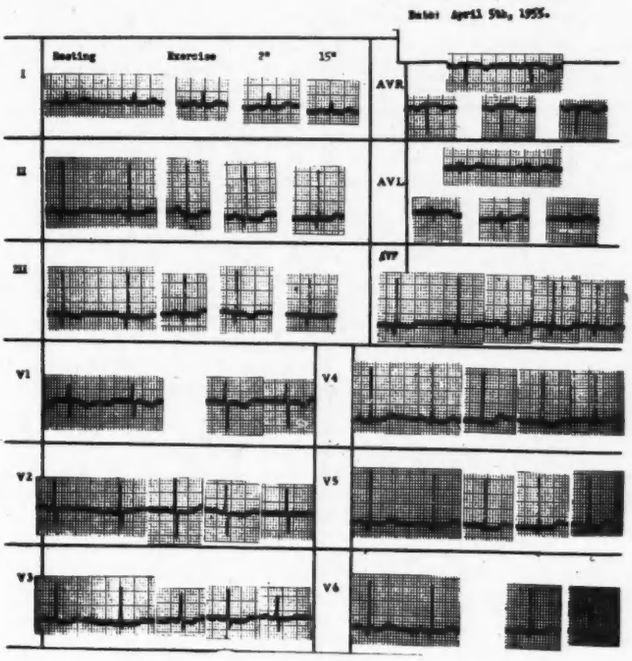

Fig. 3

was positive with marked T wave changes. It was not until later that we discovered she had been on one grain of digitalis three times a day, for her palpitations. It is important to remember that digitalis may predispose to a positive test in a normal heart.[10]

SUMMARY

Recent studies have shown that the range of normal response to exercise is much greater than that originally proposed by Master. The use of the Master criteria would include many false positive tests.

Even with the most rigid criteria, positive tests are seen in persons who have no symptoms of angina and no history of heart disease, but who complain of minor chest discomfort which is non-specific in character. Since there is no independent corroborating criterion, clinical judgment would suggest the use of more rigid electrocardiographic standards. Those of Simonson have the sanction of being derived from well-controlled studies on "healthy" individuals in the age group with the highest incidence of clinical coronary disease.

A negative Master test does not exclude severe coronary disease or even impending infarction.

A positive exercise test, even one derived from more rigid criteria, should be only one factor considered in summing up the clinical picture.

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RÉSUMÉ

De récents travaux en cardiologie ont montré que la gamme normale des réactions à l'effort est beaucoup plus étendue que le suggérait Master lorsqu'il publia la description princeps de son épreuve. L'emploi de ses critères porterait à inclure dans ce test plusieurs faux positifs. Même avec des exigences plus strictes un résultat positif est obtenu chez des sujets qui ne présentent aucun symptôme d'angine ou aucun antécédent d'atteinte cardiaque, mais qui accusent de vagues malaises à la poitrine. Dans de telles circonstances le jugement clinique semble exiger des normes électro-cardiographiques plus étroites. Celles de Simonson offrent l'avantage d'avoir été tirées d'études bien contrôlées de sujets en santé dans les âges où les manifestations cliniques de la maladie des coronaires sont les plus nombreuses. Une épreuve de Master négative n'exclue pas la possibilité d'une maladie coronarienne ou d'un infarctus imminent; positive, même d'après les critères les plus rigides, elle ne doit représenter qu'un facteur dans la synthèse du tableau clinique.

WHAT LEADS SHOULD BE USED IN ROUTINE ELECTROCARDIOGRAPHY?*

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TWENTY-FIVE years ago this question would not have been raised. The three bipolar limb leads introduced by Einthoven had become standard procedure and were generally assumed to provide all the information necessary in electrocardiographic diagnosis. Although Lewis[1] had used chest leads in 1909 in a study of atrial fibrillation, they did not become a part of routine electrocardiography until they were popularized by Wilson[2] 35 years later. Unipolar limb leads were the natural outcome of Wilson's[3] experiments with the central terminal. In 1942 Goldberger[4] developed a technique for augmenting the unipolar limb leads, and incidentally advocated a so-called central terminal which may result in large errors due to differences in the resistance of the skin under the electrodes.[5] In the past, electrocardiographic interpretation has been largely empirical. This painfully and slowly acquired experience should not be undervalued, but it is unfortunate that

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empiricism still dominates interpretation for most electrocardiograph owners. The newer knowledge of the depolarization and repolarization of the heart muscle and of the distribution of the electrical field in the body, though far from complete, is poorly understood by most physicians and is largely disregarded because of its complexity and the time required to master it.

The choice of leads for routine electrocardiography seems often to be based more on a desire to be "up-to-date" and take a "complete" set of leads than on sound electrophysiological principles. Although a very large number of leads could be taken, practical considerations have limited clinical electrocardiography to 12 or 13 leads except for special studies. The mounting of so many leads is time-consuming and costly. Is the employment of all these leads really justified by the information obtained? For reasons which will be set forth, we believe that the three bipolar limb leads of Einthoven and the six standard precordial leads provide all the useful information that can be obtained from a routine electrocardiogram. The unipolar limb leads do *not* provide any information which is not represented in the three standard bipolar leads. All six standard chest leads, however, should be employed in order to obtain a complete picture of the changes across the precordium.

FRONTAL PLANE LEADS

Schaffer *et al.*[5] among others have studied the question of what leads are useful in routine electrocardiography and have concluded that only two leads (I and aVf) will give all the necessary information about the frontal plane and that at least six chest leads are required for reasonably complete coverage. Gardberg[7] has made some pungent remarks about some of the new methods of analyzing leads. In part he says: "Those who have become enamored of the so-called unipolar limb leads speak of these as if the electrodes are closer to certain areas of the myocardium than those of the standard limb leads and yet they are the same electrodes employed in recording the standard limb leads. . . . The erroneous notion that unipolar limb leads reflected changes in the myocardium 'faced' by each limb electrode better than vector analyses employing the standard limb leads, led to a regression to more empirical and more erroneous electrocardiograph interpretations than have been fashionable prior to the introduction of these notions." To many interpreters of electrocardiograms, the advent of unipolar limb leads has meant an increase in the onerous burden of memorizing rules-of-thumb already too numerous and often misleading.

When Einthoven[8] instituted the bipolar limb leads he made the assumption that the current source is a single dipole relatively remote from the electrodes and lying in the same plane, that the tissues are sufficiently homogeneous not to alter the electrical conductivity, and that these leads form an equilateral triangle. He was quite aware that these assumptions were not exactly in accord with the facts, but their practical value has been demonstrated over the years.

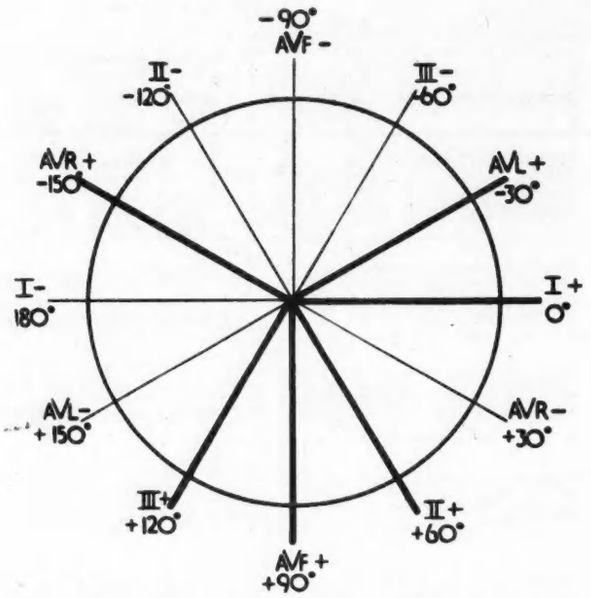

Fig. 1.—Hexaxial system of frontal plane leads showing their angular relationships. The standard bipolar and unipolar limb leads, as usually taken, are marked with the heavy lines. Lead aVr, taken with the conventional polarity, does not fit into this scheme. (See text.)

For reasons too detailed to go into here, it is possible and indeed useful to represent the bipolar and unipolar limb leads by means of a hexaxial system,[9] which shows the angular relationships between them. The centre of the hexaxial system is arbitrarily regarded as negative with respect to any point at the periphery (Fig. 1). These leads, with the exception of aVr, are separated each from its neighbour by an angle of 30°. Lead aVr is routinely (and wrongly from the practical viewpoint) taken so that it lies at an angle of −150° relative to lead I. If the polarity of lead aVr is reversed, it is then situated at an angle of +30° from lead I and lies in a logical position between leads I and II. The polarity of all the limb leads may be reversed as demonstrated in Fig. 2.

Inspection of the complexes, starting with aVl and moving clockwise around the circle reveals that there is a progressive change in the amplitude and contour of the various portions of the QRS and T waves. This is what one would expect if the vectorial concept applies. A sudden marked change in QRS or T contour in a unipolar lead, grossly inconsistent with the contour of the standard lead on either side of it, is not encountered. If the hypothesis that the unipolar leads "face" and "sample" the nearest part of the myocardium were true, one could reasonably expect such a unipolar lead to differ strikingly from the adjacent standard leads, particularly where local myocardial damage is present. In fact they do not so differ (Fig. 2).

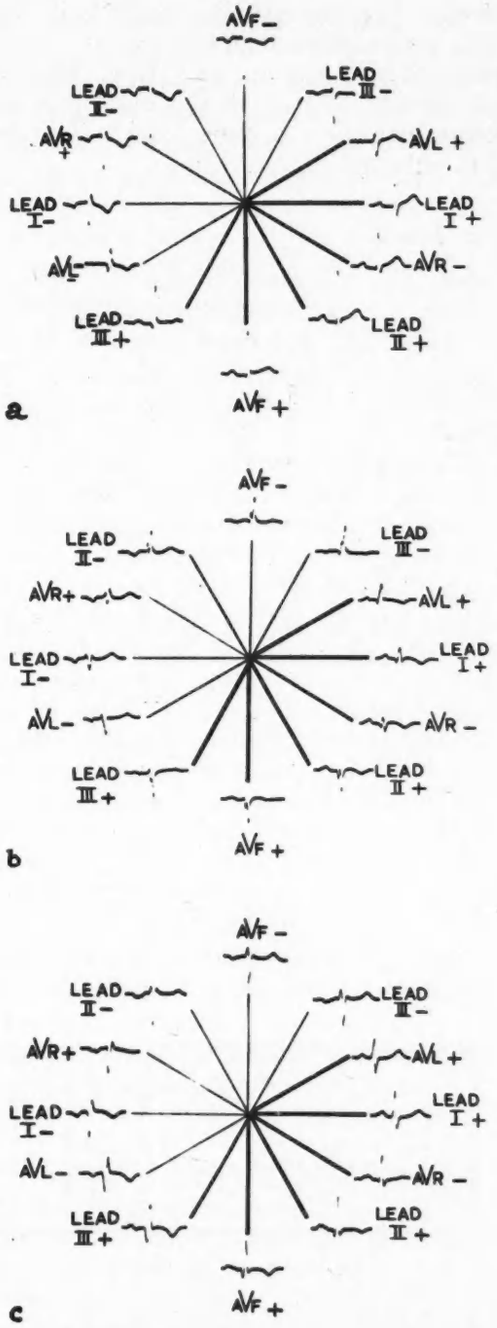

Fig. 2.—(a) Normal record with each lead mounted according to the hexaxial system, showing the gradual change in R/S ratio from aVl to lead III and the gradual increase and decrease in the amplitude of T. (b) Record showing anterior infarction with the negative T deepening, then becoming posi'ive as one moves from aVl to lead III. (c) Record showing posterior infarction with T becoming flattened at aVr (reversed), then increasingly negative from lead II to lead III. A small Q appears in II and deepens as one moves clockwise.

In order to understand the proof of the fact that unipolar leads are part and parcel of the same phenomenon as the limb leads, it is necessary to discuss briefly the vectorial concept mentioned above. A vector is a method of representing the magnitude, direction and sense (polarity) of any force, in this case the electrical force of the heart. There is at any instant of time a multitude of these individual forces originating in the myocardium, which may be represented by a single resultant vector. Throughout the electrical cycle this vector continuously changes from moment to moment in magnitude and direction. If the successive series of instantaneous vectors are made to have the same origin and if their termini are joined, a closed three-dimensional loop called the vectorcardiogram is formed. A frontal plane projection of this loop may be obtained by using any two leads of the hexaxial system.* (Wilson used leads I and Vf.) Because the plates of the standard cathode ray tube are at right angles to each other, the two leads should also be at right angles to each other (Fig. 1).

If, as we shall demonstrate, the unipolar limb leads do not contain any more information than the bipolar leads, and if their actual angular relationships are approximately as represented in the hexaxial system, it is then theoretically possible to obtain three identical vectorcardiographic loops using a combination of leads I and Vf, of leads Vl and II, and of leads Vr (reversed) and III. When recorded simultaneously these loops will be alike in shape but the main axes of the latter two will be rotated at an angle of about 30° on each side of the former. If any lead were to contain information not in accord with this concept, the shapes of these vectorcardiograms would differ significantly one from another.

Because the heart is eccentrically situated with respect to the limb electrodes, one cannot with strict accuracy represent the magnitudes and directions of the standard leads by the Einthoven triangle. Burger[10] has shown that this triangle is actually asymmetrical (Fig. 3). It follows then

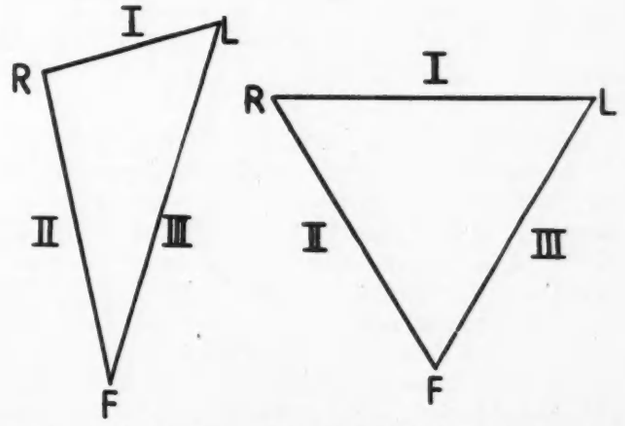

Fig. 3.—On the left, a Burger triangle portraying the asymmetrical character of the bipolar leads due mostly to the nearness of the left shoulder to the heart. On the right the equilateral triangle as visualized by Einthoven.

that the axes of the unipolar and bipolar leads are unlikely to be exactly 30° apart, and even less likely that any pair of leads used in vectorcardiography will be exactly 90° apart. To the extent that they deviate from the ideal state, one might expect differences in the vectorial loops so derived.

*When a unipolar lead (Vr, Vl, Vf) is used in vectorcardiography its amplitude must be multiplied by the factor $\sqrt{3}$.

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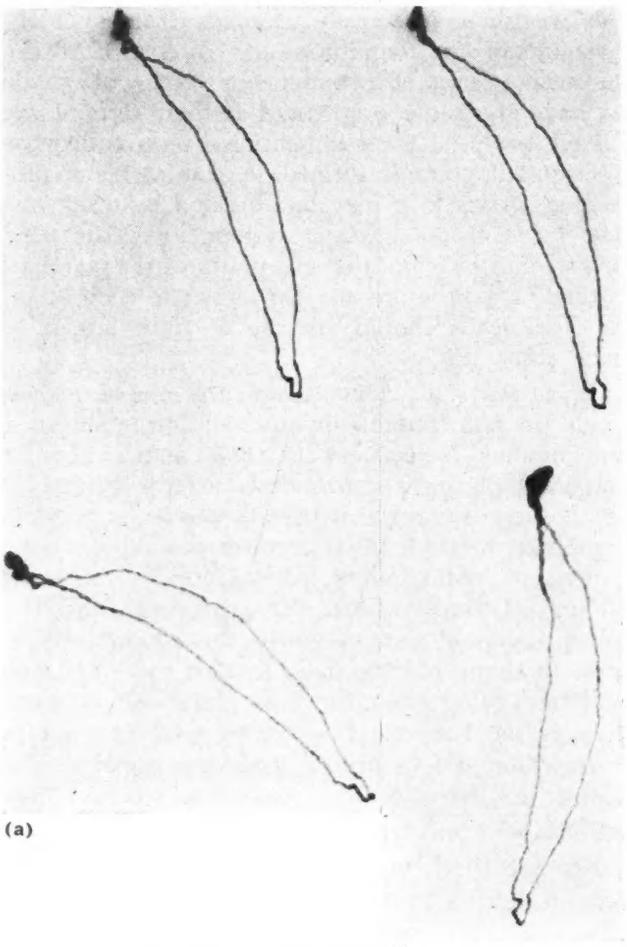

(a)

(b)

Fig. 4.—(a) The upper QRS vectorcardiogram of the simultaneous pair uses I and Vf (Wilson). The lower vectorcardiogram uses lead III and Vr (reversed) but lies at an angle of 30° nearer the horizontal. The two are alike in all but the finest detail. (b) The upper vectorcardiogram of the simultaneous pair is the same as in Figure 4a. The lower vectorcardiogram uses lead II and Vl and lies at an angle of 30° nearer the vertical. It is similar in every important respect to the other two vectorcardiograms. The presence of so much fine detail in the vectorcardiogram is due to the fact that these loops have been taken at a high frequency response, down 3db at 6400 cycles.

The identity of the three loops taken under the above conditions has been repeatedly demonstrated for the normal (Fig. 4), for right and left axis deviation, for left and right bundle branch block, for left and right ventricular hypertrophy and for anterior and posterior myocardial infarction. This principle applies not only to the QRS loop but also to the T loop. *This fact is evidence that the bipolar limb leads encompass all of the information obtainable in the frontal plane.* This statement does not imply that the unipolar limb leads contain any less information than the bipolar, but they certainly do not contain any more. They might indeed be used instead of the bipolar in routine electrocardiography if great care were taken to equalize skin resistances.

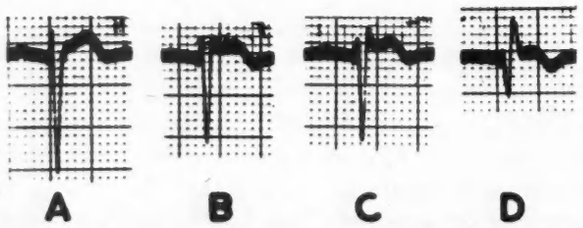

Fig. 5.—Shows the pronounced effect of slight shifts in electrode position on the form of the QRS and T. A: 1 cm. medial to V_2. B: V_2 position. C: 1 cm. lateral to V_2. D. 2 cm. lateral to V_2. The marked difference between C and D is noteworthy in view of the fact that the distance between them is only 1 cm., less than the diameter of a chest electrode.

CHEST LEADS

In 1938 the Committee of the American Heart Association for the Standardization of Precordial Leads[11] laid down directions for the placement of chest electrodes. These recommendations have been widely adopted and chest leads are now almost universally employed. The necessity for taking them is exemplified by the fact that the electrocardiographic changes in cardiac infarction may not be evident from the frontal plane leads alone and are seen only in the precordial leads. Moreover, the diagnosis of bundle branch block and ventricular hypertrophy is aided by having the six standard chest leads. The nature of atrial arrhythmias is nearly always best determined in the V_1 position. In some cases all other leads may be misleading. Atrial flutter may frequently pass as atrial fibrillation in other leads, even in the standard limb leads (Fig. 6). Various attempts have been made to reduce the number of chest leads to a minimum by taking V_4 only, V_1, V_3 and V_5 or V_2, V_4 and V_6, etc., but with these compromises one may well miss a localized change in the QRS or T waves. Satisfactory exploration of the chest therefore requires the use of at least the six pre-

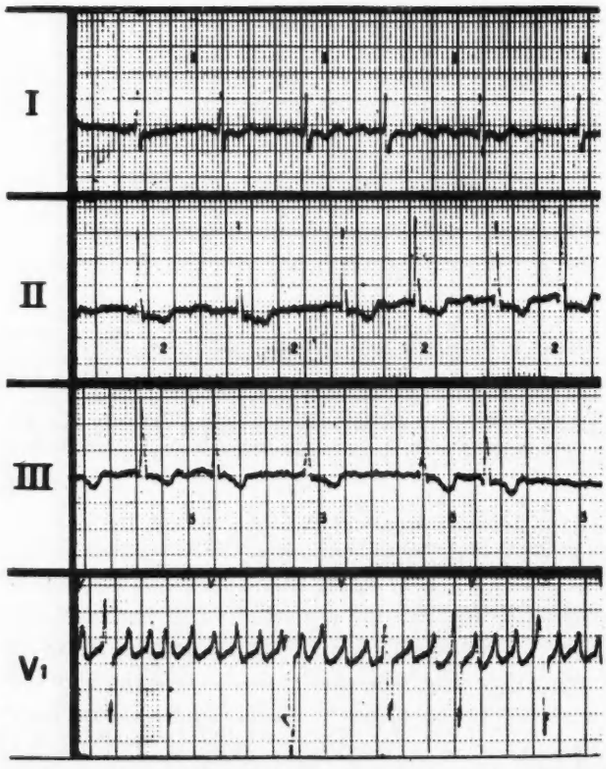

Fig. 6.—Shows the usefulness of the V_1 position in elucidating atrial arrhythmias. In the limb leads the arrhythmia could easily be mistaken for fibrillation. Lead V_1 clearly demonstrates the presence of flutter. This oversight is by no means uncommon where lead V_1 has been omitted.

cordial leads. With fewer leads one may fail to appreciate the significance or lack of significance of differences between two widely separated chest leads or between serial records of the same lead. The exact re-placement of chest electrodes in serial tracings is not possible except with special methods.[12] Variations in the appearance of a given QRS or T, which may be only the result of putting the electrode on a different site, can be mistakenly interpreted as an alteration in the state of the myocardium. Fig. 5 shows the striking changes which occasionally occur as the result of slight alterations in electrode position, a factor which seemingly is not always appreciated in analyzing serial tracings as judged by even a casual inspection of the literature.

DISCUSSION

From the above, it follows that, since these frontal plane vectorcardiograms are alike in every respect except for their angular placement on the record, no special ability of any unipolar limb lead to sample selectively the nearest portion of the heart can be demonstrated. If it were otherwise, major distortions in the size, shape and angular relationships of these vectorcardiograms, one with another, would be obvious, since each is made up of a different pair of leads, one bipolar and one unipolar. Hence there appears to be no rationale for continuing to use unipolar limb leads. This fact alone is sufficient reason to abandon them. That is not to say that they provide any *less* information than the standard leads. They do in fact provide the *same* information and one might conceivably use them instead of bipolar leads;* however, because experience with the bipolar leads is extensive and dates back half a century, there is no good reason to discontinue them.

Experienced electrocardiographers tacitly recognize that there is a personal equation in their interpretations, seldom acknowledged in print. Little effort has been devoted to the study of this problem. A recent paper by Davies[13] emphasizes the considerable variation in interpretation of both normal and abnormal records by experienced observers. It is interesting to note that the greatest difficulties were encountered in interpreting leads III, aVf and aVl. We believe that some at least of the difficulties would not have arisen if the vectorial concept had been kept in mind and if the leads had been mounted and read in the manner suggested by Graettinger.[9]

The vectorial concept as we have used it with respect to the frontal plane leads cannot at present be applied successfully to the precordial leads. It has not yet proven feasible to select two chest leads which will give all of the information available in the transverse plane. Whether or not local potentials significantly affect the form of these complexes is in dispute. This is illustrated by the fact that in certain cases isolated changes, particularly in T waves, do occur. It is therefore at present necessary to take at least the six standard chest leads in order to obtain all the information known from experience to be useful.

*This is true only provided that extreme care is taken in the preparation of the skin to ensure that each limb connected to the central terminal has the same impedance.

SUMMARY

A theoretical evaluation of the usefulness of certain leads used in routine electrocardiography has been undertaken.

Reasons have been adduced for discontinuing the use of unipolar limb leads which provide no information not already available in the standard bipolar leads. In practice unipolar limb leads may lead to confusion in interpretation because of a false belief that they "selectively sample" the nearest portion of the myocardium.

The value of a full set of six chest leads has been emphasized.

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RÉSUMÉ

Les auteurs présentent une évaluation théorique de l'utilité de certaines dérivations consacrées par l'usage en électrocardiographie. Ils offrent leur raison de ne plus employer les dérivations unipolaires des membres sous prétexte qu'elles n'ajoutent rien aux renseignements que fournissent les dérivations bipolaires périphériques (standard). Au point de vue pratique celles-là peuvent porter à confusion dans la lecture des traçés en vue de la croyance mal fondée qu'elles reflètent de manière sélective l'activité électro-motrice de la portion la plus rapprochée du myocarde. Par contre l'importance de la série complète de six dérivations précordiales est mise en évidence.

BIGOTRY IN MEDICINE

"After Galen none in Christendom dared comment critically on medical matters for nearly a thousand years, but Greek medicine was kept alive during the dark ages by the Arabian schools who, when the thousand years were past, were to return to the Europe of the Renaissance some of the information they had cherished. From that time on the story of medicine is well known and, while we may well take pride in our ancient lineage, medical thought today seems to be so hidebound that deviation from the accepted way of thinking is considered almost as great a crime as deviation from religious thought was in Reformation times, and as political deviation is in the twentieth century."—Editorial, *South African M. J.*, 32: 933, 1958.

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PILOT STUDY ON TRAFFIC ACCIDENTS

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Montreal

AT THE MONTREAL CONFERENCE on Traffic Accidents, held in 1955, all the reports emphasized that much information was lacking, and more data, collected in a uniform and comparable manner, were necessary to point out the areas in which preventive action could be taken. This problem is not peculiar to Canada, for a recent bulletin of the World Health Organization[1] comes to this same conclusion, and comments on the impossibility of comparing the statistics of one country with those of another because of variations in methods of reporting.

Mortality statistics are available and provide some clue to the magnitude of the accident problem. However, low mortality may conceal a high morbidity, e.g. the mortality from poliomyelitis is relatively low, but does not give any indication of the disabilities resulting from the disease.

Morbidity statistics are more revealing but much more difficult to obtain. In Montreal, police records note the number of persons injured in traffic accidents, classifying the injury as severe or slight, but there is no follow-up of what the eventual outcome may be, unless it ends fatally. In 1957 traffic accidents in the city of Montreal caused 144 deaths, and 9721 persons were injured. How many of the injured have some residual disability is not known. There is at present in Montreal a five-year-old boy who was hit by a car while walking on the sidewalk with his mother in November 1957. He has a complete right-sided hemiplegia, he is aphasic, and he responds to simple questions by head movements, but in spite of having had prompt treatment and all rehabilitation services there is very little hope of further recovery. Recently in the news there was a report of a six-year-old girl in the U.S.A. who is paraplegic as a result of injury when she was a passenger with her father when their car was hit by a truck in 1955. How many other cases are like these, of the approximately one million non-fatal injuries sustained in motor-vehicle accidents on this continent each year?

PRESENT STUDY

One method of collecting morbidity data is from hospital records. A universal difficulty in this regard is that case records are classified by disease, and in few if any hospitals is it possible to select accident cases from the cross-index. When it was proposed to do a study on traffic accidents in the Montreal General Hospital this was found to be the first obstacle. The second obstacle was that all the required information in relation to cause, manner of injury, and place of accident was frequently not recorded in sufficient detail.

It was decided that all cases coming because of injury resulting from a traffic accident would be recorded as they came to hospital. This procedure would be followed for at least a year in order to determine seasonal variations. A special form for collection of data would be used. As children are not admitted to the Montreal General Hospital, data were collected at the Montreal Children's Hospital also.

Questions to which answers are sought by this collection of data are:

What proportion of city traffic injuries are treated at the M.G.H. and M.C.H.? Is it a representative sample?

Do first aid, transportation, and emergency services need to be revised and improved?

What are the consequences of traffic accidents as seen at these hospitals?

During the period of this study the Montreal Police Department has supplied monthly reports of the accidents occurring within the city limits. Table I shows the number of traffic-accident patients treated at the M.G.H. and M.C.H. Of the 515 patients seen in seven months (September 1957 to March 1958), 85% were injured in the city of Montreal, and 15% in accidents which occurred outside the city limits.

TABLE I.—PATIENTS FROM TRAFFIC ACCIDENTS TREATED AT TWO HOSPITALS

Seven months (September 1957 to March 1958)			
	Total	*Injured in Montreal city*	*Injured outside Montreal*
Montreal General	366	86.7%	13.3%
Montreal Children's..	149	81.2%	18.8%
Total.....	515	85.0%	15.0%

TABLE II.—COMPARISON OF TOTAL TRAFFIC ACCIDENT INJURIES IN THE CITY OF MONTREAL WITH CITY INJURY CASES TREATED AT TWO HOSPITALS (SEVEN MONTHS)

	Police reports	*Montreal General*	*Montreal Children's*
15 years and over....	4072	317 7.8%	
Under 15 years.....	1171		121 11.5%
Totals.....	5243 100%	438 8.3%	

Comparing the city cases with the police reports, Table II shows that only 8.3% of the total reported as injured in the city were taken to these two hospitals. This raises a question whether this 8% can be taken as a sample representative of city cases. Without further knowledge of the other 92% it cannot. Of the 72 city fatalities in this period, it is not known how many reached any hospital, and how many went directly to the morgue. (This information is not recorded by the police.)

AREA FROM WHICH PATIENTS CAME TO M.G.H.

The majority of the city cases brought to the M.G.H. come from an area within a radius of one to two miles from the hospital. The police take patients to the nearest hospital unless the patients request otherwise. From the epidemiological point of view we do not know whether or not the risk of traffic injury is the same in this part of the city as in others, nor do we know what part selection may play in bringing a patient to this hospital. Selection does occur in cases referred from out of town, particularly in neurosurgical and plastic surgery cases where patients are transferred from hospitals without these special services.

TRANSPORTATION TO HOSPITAL

Ambulance service comes in for a great deal of discussion. Each locality has its own particular problems. At the M.G.H. and M.C.H. for this seven-month period, 70% of patients were brought to hospital by police car, and 21% by ambulance to the M.G.H. and 13% to the M.C.H. (Table III).

TABLE III.—MEANS OF TRANSPORTATION TO HOSPITAL (SEVEN MONTHS)

	Montreal General	*Montreal Children's*
Ambulance	21.5%	13.2%
Police	69.5%	70.1%
Other	9.0%	16.7%

(Radio police arrive at the scene of the accident first and call an ambulance when they judge it necessary. All constables are trained in first aid.)

TABLE IV.—MONTREAL GENERAL HOSPITAL AMBULANCE RUNS (SEVEN MONTHS)

Total	2493	100.0%
Called by police	909	36.5%
Traffic accidents	59	2.3% (6.5% of police calls)

At the M.G.H. a record is kept of ambulance calls. Table IV shows that ambulances for traffic accidents accounted for only 2.3% of the total runs, or 6.5% of those called by the police.

By keeping records of the time the accident occurred and the time the patient arrived at the hospital, it has been possible to ascertain that there has been no prolonged delay in transporting patients to hospital. The police department also keeps a record of the time the call for an ambulance was placed and that at which the ambulance arrived at the scene of the accident.

TYPES OF ACCIDENTS

Analysis of the cases treated at the Montreal General Hospital has been done for a six-month period from October 1957 to March 1958. (September was a trial month and, because of insufficient detail, was omitted. Patients referred to the Children's Hospital are almost all pedestrians and will be analyzed separately.) The proportion of pedestrian patients (39.1%) to vehicle accident

TABLE V.
TYPES OF ACCIDENTS, MONTREAL GENERAL HOSPITAL
Six months (October 1957 to March 1958)

	Patients	
Pedestrian	115	39.1%
Vehicle		
Passengers	97	32.9%
Drivers	70	23.8%
Motorcycle	1	0.3%
Bicycle	4	1.4%
Not recorded (driver or passenger)	7	2.4%
Total	294	100.0%

patients (59.9%) was slightly higher than reported for the city (Table V). From police reports it was found that, excluding children under 15 years of age, 31.1% of injured were pedestrians and 68.9% were in vehicle accidents. Of those under 15 years of age reported injured in the city 77.4% were pedestrians.

More passengers than drivers were treated for injuries. We have no controls, however, to indicate whether or not the risk to passengers is in fact greater than that to drivers, for the proportion of passengers to drivers is not known, or the number of passengers who escaped injury. (The police only take note of the number injured, not the uninjured.) It only shows that in 127 vehicle accidents 70 drivers were injured, and 57 were not—or were not treated at the M.G.H. In three accidents occurring out of town it is known that other injured were treated elsewhere, and one passenger in each accident was fatally injured.

TABLE VI.—TYPES OF VEHICLE ACCIDENTS

	No. of vehicles	
Vehicle—vehicle	92	72.0%
Vehicle—stationary object	23	18.5%
Vehicle—train	1	0.75%
Roll over	1	0.75%
Off road	1	0.75%
Not recorded	9	7.0%
Total vehicles (patients 179)	127	100.0%

The different types of vehicle accidents are shown in Table VI. Vehicle-to-vehicle accidents predominate, which is to be expected where street intersections are numerous and the concentration of vehicles is greater than outside the city. That there was only one vehicle-train accident may indicate that this form of accident contributes only a small percentage of the total. However, reports of the Dominion Bureau of Statistics[2] show that vehicle-train collisions have a high fatality rate; the one accident recorded here resulted in one death and one severe injury out of four persons involved.

AGE AND SEX OF PATIENTS

Considering injured pedestrians by age and sex (Table VII), it appears that there is a predomi-

TABLE VII.—AGE AND SEX OF PEDESTRIAN PATIENTS

Ages	Male	Female	Total	%
15 - 19	3	11	14	26.9%
20 - 24	13	4	17	
25 - 29	7	6	13	16.5%
30 - 34	3	3	6	
35 - 39	5	1	6	7.8%
40 - 44	1	2	3	
45 - 49	4	3	7	13.0%
50 - 54	2	6	8	
55 - 59	7	4	11	16.5%
60 - 64	5	3	8	
65 - 69	6	3	9	
70 - 74	6	2	8	19.5%
75+	3	2	5	
Totals	65	50	115	
	56.5%	43.5%		

nance of injuries in the young and the old. This however should be adjusted to take into consideration the proportion of the population in each age group. Also it is unlikely that all age groups have the same exposure, persons over 70 being less likely to be on the street. Probably in relation to their numbers and exposure, the risk of injury is higher to pedestrians over 65 years of age.

In analyzing the age and sex distribution of drivers, there is again a lack of controls. As this is a heterogeneous group, the percentage of registered drivers in each age group is not known, nor is their exposure in terms of number of miles

TABLE VIII.—AGE AND SEX OF DRIVER PATIENTS

Ages	Male	Female	Total	%
15 - 19	2	1	3	38.5%
20 - 24	22	2	24	
25 - 29	8	1	9	28.5%
30 - 34	10	1	11	
35 - 39	8	0	8	20.0%
40 - 44	4	2	6	
45 - 49	5	2	7	11.4%
50 - 54	1	0	1	
55 - 59	0	0	0	
60 - 64	1	0	1	1.4%
65+	0	0	0	
Totals	61	9	70	
	87.2%	12.8%		

driven per year. There are persons who hold drivers' licences and rarely drive. Similarly, in comparing the number of men and women drivers, though there are now women taxi drivers in Montreal, the majority of holders of chauffeur licences are males, and the number of miles driven is vastly different between the sexes.

TIME OF ACCIDENT

When considering the time of accident it is also necessary to think of the density of population on the streets at any given time of day. Between 4 p.m. and 8 p.m. is the busiest for people going home from shopping or work, but the rate of accidents per exposed population may not be as great as from 8 p.m. to 4 a.m. This is particularly relevant to vehicle accidents (Table IX), the greatest percentage of accidents occurring between

TABLE IX.—TIME OF ACCIDENT

	Pedestrian	Vehicle accidents
12 midnight to 3.59 a.m.	8.8%	26.6%
4 to 7.59 a.m.	5.3%	12.6%
8 to 11.59 a.m.	11.5%	6.8%
12 noon to 3.59 p.m.	9.7%	12.6%
4 to 7.59 p.m.	43.4%	22.2%
8 to 11.59 p.m.	20.3%	17.0%
Not recorded	0.8%	2.2%

midnight and 4 a.m., and the density of vehicle traffic is certainly not as great as in the evening "rush hours".

TYPES OF INJURIES

Of the total of 294 patients seen at the M.G.H. in the six-month period, 79.3% were treated as outpatients and 20.7% were admitted to the wards.

TABLE X.
TYPES OF INJURIES TREATED IN CASUALTY DEPARTMENT

	(79.3% of total patients)		
Lacerations	63 patients	Sutured	50.0%
		Radiographed	25.0%
		Fracture also	8.0%
		Dressings only	30.6%
Fractures	28 patients	Nose	3
(2 patients had 2 fractures)		Maxillary sinus	1
		Clavicle	4
		Ribs	3
		Upper extremity	9
		Lower extremity	10
Abrasions, contusions, sprains or strains only—	144 patients	Radiographed	40.2%
		Urinalysis	4.9%
		No injury	5.5%

Of the less serious cases (Table X), 63 had lacerations, 50% requiring sutures; 25% also underwent radiological examination and 8% had fractures. But 30% had dressings only, i.e. they did not need hospital treatment.

Twenty-eight patients had fractures (two patients had two fractures) which could be treated without admission, and followed up in clinic.

The other 144 outpatients had abrasions, contusions, sprains or strains only; 40% were radiologically examined and 5% had urinalysis; 5% had no detectable injury. The police always offer to take anyone injured to hospital, and some undoubtedly come for examination because they are emotionally upset. Unnecessary radiographs are probably taken, but it is often a question of compensation or insurance and to be overcautious in this regard is preferable to risk missing a fracture.

It appears that 43.5% of the total number of outpatients did not need hospital services.

In assessing the efficiency of the casualty department, only three errors of omission were noted: a minor fracture of the fibula not originally examined by x-rays, a maxillary sinus fracture, and a cervical spine injury requiring treatment in hospital.

Admitted patients.—Sixty-one patients (20%) were admitted: 15 drivers, 14 passengers, 31 pedestrians, and one bicycle rider (Table XI). Twenty-three patients (37.6%) had dangerous injuries, and three pedestrians (4.9%) died. All three fatalities were due to head injuries. These 61 patients had 121 injuries, of which 19% were classed as dangerous—injuries to head, cervical spine, thorax, and lumbar spine (Table XII).

TABLE XI.—NUMBER OF INJURIES BY BODY AREA AND CATEGORY OF PATIENT
ADMITTED CASES, MONTREAL GENERAL HOSPITAL

Area injured	*Drivers (15 patients)*	*Passengers (14 patients)*	*Pedestrians (31 patients)*	*Bicycle (1 patient)*
Head	10	13	25	
Neck and cervical spine	2	2	1	
Thorax and thoracic spine	6	4	3	
Abdomen, pelvis, and lumbar spine	3	2	8	
Upper extremity	4	4	4	
Lower extremity	7	6	16	1
Total injuries	32	31	57	1
% dangerous injuries	12.5%	29.0%	17.5%	0
% fatal injuries	0	0	5.2%	0

Of the total 294 patients, 1.2% had fatal injuries, 7.8% dangerous injuries, 11.9% serious but non-dangerous, and 79% minor injuries.

LENGTH OF STAY IN HOSPITAL

Hospitalization varied from one day to 144 days (this latter figure applies to a patient still in hospital at termination of the survey) and averaged 25 days. This does not tell the whole story, for seven cases were discharged to the Convalescent Hospital, three were readmitted and another may require readmission for further plastic surgery.

TABLE XII.—PERCENTAGE OF DANGEROUS AND FATAL INJURIES BY BODY AREA
ADMITTED CASES, MONTREAL GENERAL HOSPITAL

Area injured	*No. of injuries*	*% dangerous*	*% fatal*
Head	48	33.3%	6.4%
Neck and cervical spine	5	80.0	
Thorax and thoracic spine	13	15.4	
Abdomen, pelvis, and lumbar spine	13	7.8	
Upper extremity	12	0	
Lower extremity	30	0	
Totals	121	19.0%	2.4%

Many are not fit for work at time of discharge, having gone out on crutches or with walking casts. Follow-up is still continuing in clinics. To give two examples of length of disability, one man was in hospital only six days and another 14 days, yet both were off work more than 10 weeks.

Four patients are known to have permanent disabilities. One lost an eye, two have lost sight in an eye because of severe cerebral trauma, and one has a residual hemiplegia. Two patients have been referred to rehabilitation centres.

CAUSES OF ACCIDENTS

Information about the causes of these accidents is most deficient. Patients often do not know what happened, or are reluctant to admit if they were at fault. Police records state only bare facts. (In court a judge said they had no right to give an opinion, so they record none.) Witnesses are not always present and history taking is not sufficiently detailed.

Alcohol, road conditions, and mechanical failure of brakes have been noted as factors in a small number of cases, but have probably only been part of the total picture. In almost all cases it is more than likely that there are multiple causes; there is a "chain of events" with predisposing, provoking, and precipitating causes.

DISCUSSION

In reviewing this six-month period, the answers to the questions originally asked seem to be:

1. This sample cannot be taken as representative of the population of Montreal as it accounts for only 8% of the total reported cases.
2. For the period under review there has not been any evidence that the transportation and emergency services have been inefficient.
3. The consequences of traffic accidents have been fatal to 1.2%; serious to 19% of this group of patients, minor to 43%, and so slight to 36% as not to have disabled them beyond the day of the accident.

Any hospital study of traffic accidents is limited in many ways, but provides morbidity detail that supplements mortality data, and aids in detecting local accident problems. It is imperative that accident histories should be taken with more care, and every doctor should start by asking for details of where, when, how, and why the accident occurred. Data need to be collected in a uniform manner allowing for comparison between areas, so that areas of low incidence can be studied in relation to those of high incidence (e.g. Medicine Hat, population 20,600, to October 31, 1957, had 1090 days without a traffic fatality; Trail, B.C., population 11,000, had 1054 days).

Special investigators undoubtedly are needed for scientific research in relation to causes; program planning by experimental designers is essential so that unbiased sampling will be obtained.

The following quotation from the summary of observations and recommendations of the W.H.O. Advisory Group re-emphasizes the essential points: "Fact-finding is basic to the development of accident-prevention programs. Morbidity studies are necessary as a complement to mortality data. The use of epidemiological techniques for fact-finding is recommended, especially in connection with morbidity studies. Emphasis is placed on relating

the incidence of accidents to the population at risk and, whenever possible, to the frequency of the hazard to which the individual is exposed. In assembling information on accidents, stress should be laid on reporting the chain of events or circumstances which led up to the actual traumatic event; information about social circumstances (e.g. overcrowding) and the physical and emotional condition of those involved in the accident is of value for research purposes."[1]

SUMMARY

A study of morbidity due to traffic accidents was undertaken at the Montreal General Hospital. Figures were combined with those of the Montreal Children's Hospital for comparison with police reports of traffic accidents. Efficiency of transportation and emergency services was examined. Injuries were fatal to 1%, serious to 19%, minor to 43%, and minimal to 36%.

Further detailed studies, scientifically planned, are needed, particularly in relation to cause and prevention of accidents.

Every doctor can contribute to further research by careful enquiry into the circumstances of each accident case which comes under his care.

Hospital records of all accidents should be coded according to etiology, as accidents are now a leading cause of mortality and morbidity towards which as much attention must be directed as to heart disease and cancer.

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REFERENCES

1. World Health Organization: Accidents in childhood—facts as a basis for prevention. Tech. Rep. Ser. No. 118, 1957.
2. Canada, Dominion Bureau of Statistics: Motor vehicles accidents, Queen's Printer, Ottawa, 1956.

APPENDIX

MINIMUM INFORMATION FOR ACCIDENT HISTORIES

Name Address Case No.
Age Sex Occupation
Date and hour of accident
Hour of arrival at hospital or doctor's office
Place of accident

Type of acident (vehicle-vehicle, head on, rear end, side, vehicle-stationary object, vehicle-pedestrian)
RESPONSIBILITY of patient in relation to accident
Nature of injury
Result of accident (minor, major, serious to fatal)
Number of persons involved in acident; number of persons injured

RÉSUMÉ

L'auteur présente une étude de la morbidité chez les accidentés de la circulation traités à l'Hôpital Général de Montréal pendant une période de six mois. Certaines données furent recueillies à l'Hôpital des Enfants (Montréal) et d'autres, extraites de rapports de police. L'efficacité des services et méthodes de transport d'urgence fut examinée et trouvée satisfaisante. La gravité des blessures s'établit comme suit: fatales 1%, graves 19%, légères 43% et minimes 36%. D'autres enquêtes menées de manière scientifique devront être entreprises afin d'obtenir plus de renseignements sur les causes d'accidents et partant, sur les moyens de prévention. Tous les membres de la profession pourraient contribuer à ces recherches en prenant soigneusement note des circonstances de chaque cas d'accident qu'ils sont appelés à traiter. Les dossiers des hôpitaux pourraient aussi être compilés d'une manière systématique dans la même intention. Une classification codifiée devrait être établie pour cette cause de morbidité comme on l'a déjà fait pour les maladies du cœur et pour le cancer.

THE TRANSMISSION OF VENEREAL DISEASE THROUGH HOMOSEXUAL PRACTICES

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IN 1951 KANEE AND HUNT[1] reported on a "hitherto unsuspected method for the spread of venereal disease—namely homosexuality". Before 1948 there had been no reports from private physicians or public venereal disease clinics which would indicate that syphilis or gonorrhœa was being spread through homosexual practices in British Columbia. In that year three male clinic patients reported that they had acquired their disease from other males and in 1950, 11 patients with infectious syphilis and nine patients with gonorrhœa admitted that they had acquired their disease through homosexual contacts. This comprised 17% of all the infectious syphilis reported in the province for the year and 50% of all the primary and secondary cases seen at our Vancouver clinics in the same period.

Active steps were taken at the time to bring this outbreak under control. Every diseased patient who admitted to homosexual practices was questioned at length, the seriousness of these diseases was explained to him and his co-operation was solicited. As a result, the names of almost 100 contacts were secured, nearly all of whom were located and the necessary examinations done to determine whether or not they were infected. Few, however, were found to be diseased.

In the following six years, the incidence of infectious syphilis dropped markedly in British Columbia. By 1956 primary and secondary syphilis had become almost a rarity, only 11 cases being reported in the whole province. Even that most stubborn of diseases, gonorrhœa, seemed to be yielding to the efforts being made to control it.

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The 4611 cases reported in 1950 were reduced to 2494 by 1956.

During these six years only a few clinic patients named contacts of the same sex, despite the fact that the staff of the Division now questioned all male patients with this method of transmission in mind. There were probably several reasons for the lull – chance, missed cases, the reluctance of patients to reveal such information and the very sharp drop in the incidence of syphilis – all must be considered before concluding that the venereal diseases had suddenly ceased to become a factor in the life of the homosexual.

Early in 1957 the increase in infectious syphilis which had been noticed in other parts of Canada and the United States for some years suddenly became evident in British Columbia. With this recrudescence, increasing numbers of our male patients again began to admit to male contacts. This time, in contrast to our previous experience, many of these contacts when located were found to be infected with early syphilis. By the end of 1957, 42 cases of primary or secondary syphilis had been reported, an increase of 380% over the year before, and of these, 16 freely admitted recent homosexual contacts and another five were strongly suspected of having acquired their lesions in the same way. During the year not less than 77% of the males treated for early syphilis in our Vancouver clinics admitted homosexual activity. In this same period, 11 cases of gonorrhœa were diagnosed in males who listed other men amongst their sexual contacts.

In the first four months of 1958, 13 males who admitted homosexual acts were examined because they were named as contacts or presented with symptoms. Of these, seven were shown to have gonorrhœa and five to have syphilis in the early stages.

Thirty-nine cases of venereal disease have been reported as resulting from homosexual practices since January 1957; 16% of these were reported by physicians in private practice. During this same period, 60% of all reported cases of infectious syphilis and gonorrhœa were seen by physicians in their own offices. It seems fair to assume that some physicians are unknowingly treating patients infected through homosexual contacts and that our figures represent only a part of the true incidence.

In the series reported by Kanee and Hunt in 1951 there was one woman. In this present series, all our patients were men and there has been no suggestion of transmission from woman to woman.

One point must be clarified before the cases just mentioned can be described in detail. Eight of our patients (24%) volunteered the information that they were having a regular or occasional sexual relationship with both male and female partners. Some of them, if their statements are to be believed, have regular relationships with women and admit to only isolated incidents with their male companions. Others are exclusively homosexual. It would seem wrong, therefore, to label everyone who admitted to homosexual relations as a "homosexual". About one-quarter of such people we have seen are "bi-sexual", and of this group, some indulge in only occasional escapades with men and others only rarely have intercourse with women.

1. *Venereal disease in men with admitted homosexual contacts, January 1957 - April 1958.*

Syphilis—Primary	9	Gonorrhœa	18	
Secondary	0			
Early latent	9			
C.N.S.	3			
Totals	21		18	39

2. *Site of lesion (where present)*

	Penile	*Oral*	*Rectal*
Syphilis	8	0	4
Gonorrhœa	16	0	1

3. *Previous infection with a venereal disease*

Admitted	18*
Denied	21

*Our records show one patient to have had gonorrhœa four times and one twice previously.

4. *Marital status*

Single	35
Married or divorced	4

5. *Place of birth*

Canada	28
British Isles	3
Continent	4
Other	4

6. *Usual occupations*

Clerk	12
Labourer or truck driver	9
Cook or waiter	7
Student	5
Seaman	2
Other	4

7. *Age of patients*

Minimum	*Maximum*	*Average*
19	52	26

8. *Number of contacts elicited*

Syphilis—		Gonorrhœa—	
Male (by name)	41	Male (by name)	17
Male (unknown)	14	Male (unknown)	6
Female (by name)	7	Female (by name)	4
Total	61	Total	27
Average per case	2.9	Average per case	1.5

9. *Role played by patient*

Active	*Passive*	*Versatile*	*Not stated*
10	10	13	6

A review of the 39 cases seen during the last 16 months reveals several interesting things. The ratio of gonorrhœa to infectious syphilis amongst our male heterosexual patients attending our Vancouver clinics in 1957 was 3 to 1. The ratio of gonorrhœa to syphilis amongst our homosexual patients for the same period was 2 to 1. While these ratios certainly do not represent an accurate picture of the situation because of incomplete reporting, nevertheless they appear to indicate that the promiscuous homosexual who acquires a venereal disease is more likely to contract syphilis than is his heterosexual counterpart.

We were rather surprised to discover that four of our patients were or had been married. Of these, one was involved in an apparently isolated incident and was otherwise leading a satisfactory married life. One was separated, one was divorced, and the fourth, just recently married, was obviously heading for a separation.

There appears to be nothing of particular significance about the occupations of our homosexual patients. It is interesting to note, however, that the group who gave their occupations as "clerk" lead the field, not only in Vancouver, but also in a similar study reported by Jefferiss[2] at the venereal disease department in St. Mary's Hospital, London.

Although the ages of our infected cases range from 19 to 52, and the ages of their non-infected contacts range from 14 to 75, the average fell into the same age group (25 to 34 years) from which we have always derived most of our venereal disease cases.

Our interviewing staff have gained the impression that homosexuals are, on the whole, more promiscuous than heterosexuals and are, therefore, a greater potential hazard if they contract a venereal disease. This seems to be borne out by the fact that heterosexual males give us an average of 1.4 contacts per case of gonorrhœa while our homosexual patients disclose 1.5 contacts per case of gonorrhœa and 2.9 contacts per case of syphilis.

Apparently a considerable number of our homosexual patients are willing to play the role of either active or passive partner in the sex act. When asked, 13 described themselves as "versatile", while 10 said they were always "active" and 10 claimed that they were the "passive" partner in every instance. Two problems are posed here — an "active" homosexual, or a "versatile" one playing a male part, will contract a penile lesion and thus may be able to conceal the true source of infection from the clinic or from his private physician. This has occurred in our clinic when an infected "active" homosexual gave a female name when asked about his contact. We did not realize then that we were being deceived until we learned that many passive homosexuals are frequently given female names by their more active companions. Some of the more dramatic local names we have learned of are: "Ginger Rogers", "Black Alice", "Edwina" and "Madame DuBarry".

One patient with gonorrhœa, a transvestite, proudly related how he, dressed as a voluptuous blonde, accompanied two male companions to the theatre without anyone's discovering his deceit. Subsequently at least one of his male companions also proved to be infected.

Venereal infections in homosexuals who consistently play a "passive" role can also be very easily missed. An alert physician recently correctly diagnosed an apparently ulcerated and infected hæmorrhoid as a primary lesion of syphilis. Not long thereafter, axillary and inguinal biopsies were done on a patient presenting with a general adenopathy while a chronic lesion on the lip, which later proved to be a darkfield positive secondary lesion, was treated with salves.

It is not our purpose to theorize on the underlying causes of homosexuality. Our prime interest is the control of venereal disease, and the inquiries that we have made into the personal lives and feelings of our homosexual patients have been directed towards securing information about their habits and actions which would lead towards that end. It has been our experience, which is contrary to the opinion held by many of the laity, that most homosexuals are not particularly effeminate in appearance or style of dress. Nevertheless, those of our staff who have had considerable experience in interviewing male patients for contact information are frequently able to identify this type of patient by observation and by the almost stereotyped replies that they give to our question as to the source of their infection. A story of an infection acquired from an unknown girl during a drinking bout in another city is always cause for suspicion, particularly when it is related in a soft voice by a man of apparent character and habits that belie the drunken orgy being described.

We have found it worth while to make the admission of homosexual practices easier for our patients by some such question as "Could it possibly have been another man who infected you?" This, together with assurances about the confidentiality of the information given and a statement about the seriousness of the disease if untreated, is often sufficient. Once the initial hurdle has been overcome, it is not uncommon for many of these patients to give the names of four or five contacts. Often these contacts will appear in a few hours, escorted by the patient who had gone out to locate them on his own initiative.

During our interviews with homosexual patients, we always try to determine their real feelings towards their condition. In each case we ask whether or not they have any desire to change. With but two or three exceptions the reply has always been: "No, it is too late now" or "I am happier the way I am". An appointment is made with a psychiatrist at the Provincial Mental Health Day Centre for those who express any interest in altering their way of life. Those who indicate that they are happier the way they are, are warned that the prevalence of infectious syphilis and gonorrhœa amongst homosexuals in this area appears to be increasing and are instructed to govern themselves accordingly. They are asked to tell all of their homosexual friends of the potential danger and to advise them to have frequent blood tests.

It may be argued that an approach such as this is too permissive and that it serves only to encourage a practice which will lead to the

development of an increasing number of homosexuals amongst our younger age groups.

So far we have come into contact with only two such instances. A 14-year-old boy was brought in by the police for examination. The boy, if his story is to be believed, had been "seduced" by an older man who paid him. Subsequently, he had allowed himself to be the "passive" partner for a number of other male homosexuals, thus ensuring himself of a steady supply of pocket money. Recently, a very respectable mother brought in her 23-year-old son who was a mental defective and unable to look after himself. She asked that he be examined as she had learned that he too had been persuaded to play the "passive" role for several homosexuals. Fortunately, neither of these two was infected.

In every other instance, the relationship took place between consenting adults. We are forbidden by the Act under which we function to disclose information we obtain from our patients to anyone other than to the patient's own physician. It would certainly be impossible to obtain information from these people about their contacts if they felt that anything they said was being reported to the police, who, in any case, find it difficult if not impossible to do anything when the relationship is in private between consenting adults. We feel that the greatest good results from winning the full confidence of our homosexual patients and securing from them the largest possible number of potentially infected contacts.

CONCLUSIONS

Syphilis and gonorrhœa have become a significant factor in the sex life of male homosexuals in the Greater Vancouver area during the past few years.

Not everyone who acquires a venereal infection through homosexual practices can properly be labeled a true homosexual.

It is possible in many instances for alert and experienced venereal disease workers to recognize patients who have acquired their disease through homosexual practices.

There is some evidence to indicate that cases of homosexually acquired venereal infection are being missed by private practitioners.

Homosexuals with venereal disease appear to be more promiscuous than their heterosexual counterparts. As a group, therefore, they are a greater potential menace when infected with venereal disease.

Few homosexuals appear to have any desire to alter their way of life.

The most effective method for the control of venereal disease amongst homosexuals appears to be by the examination of the largest possible number of potentially infected contacts. This can best be accomplished through the cooperation of the patients themselves.

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RÉSUMÉ

Depuis quelques années les homosexuels de la région de Vancouver ont contribué à propager la syphilis et la blennorragie. La connaissance de ces malades a montré que celui qui contracte une infection vénérienne par des pratiques homosexuelles n'est pas nécessairement un véritable inverti. Il est souvent possible au personnel des dispensaires antivénériens, avec quelque expérience, de dépister les malades qui se sont infectés au cours de pratiques uraniques. On a lieu de croire que les infections transmises de cette manière échappent au médecin dans sa consultation privée. Les tarés homosexuels paraissent plus actifs que leurs équivalents hétérosexuels. Ils représentent donc une menace plus dangereuse dans la lutte antivénérienne lorsqu'ils deviennent infectés. Peu d'entre eux semblent enclins à changer de vie. La meilleure méthode d'endiguer les infections vénériennes chez les homosexuels est basée sur l'examen du plus grand nombre possible d'agents contaminateurs. On ne peut y arriver qu'avec la collaboration des malades eux-mêmes.

OBSERVATIONS ON SUPRAVENTRICULAR PAROXYSMAL TACHYCARDIAS*

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FROM A CLINICAL VIEWPOINT auricular and nodal paroxysmal tachycardias are grouped together under the heading "supraventricular", mainly because either form of paroxysm is considered harmless. The etiology is rather obscure, and factors such as nervousness, "toxic" manifestations and digestive disturbances are held responsible for the precipitation of an attack. From the cardiac standpoint, importance is given to the effect of an attack, the rate and duration of the paroxysm being naturally of prime interest.

Prevention of recurrent attacks is not always possible because of the various precipitating factors. Quinidine is considered the drug of choice and digitalis is recommended where the former is not effective.

Personal observations on a number of patients suffering from tachycardia suggest that a separation between the auricular and nodal type may be justified on a purely clinical basis. The nodal type appears to occur in cases with subclinical heart disease, and as this group responds to adequate digitalis therapy, early recognition and treatment become of paramount importance.

*Read at the Annual Meeting of the Canadian Heart Association, Halifax, N.S., June 1958.

Four cases have been selected to illustrate the different aspects of this thesis.

CASE 1.—This man, first seen in 1942 when he was 48 years old, gave a history of rheumatic fever with valvular involvement. At that time features indicated a dominant mitral lesion. Two years later the presence of an aortic regurgitation was manifest as well. When he was seen in 1949, dilatation of the left ventricle was diagnosed from the behaviour of the apex thrust and radiological examination of the chest. At that time his

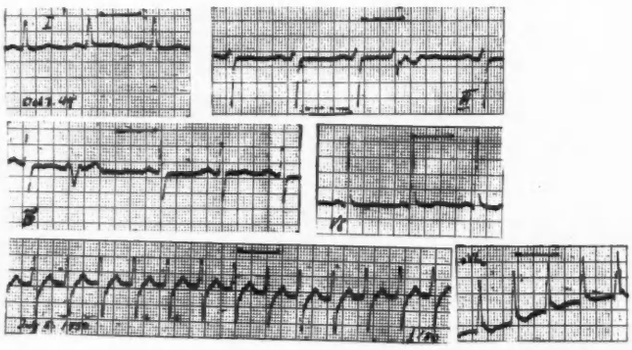

Fig. 1.—ECG from Case 1 showing the intervening free period and an attack of paroxysmal tachycardia.

blood pressure was 142/72 mm. Hg, and the rhythm was regular with an occasional extrasystole. He had a somewhat lowered vital capacity of 2400 c.c. In this year he had the first attack of typical paroxysmal tachycardia. In July 1950 he had several more attacks, all with a rate of 150 per min. They stopped spontaneously. His blood pressure in the attack-free intervals was 130/40, the heart rate was 72, and clinically there was no evidence of cardiac deterioration. Because of the frequency of the attacks he was put on quinidine, at first 1½ grains every four hours, and later 3 grains four times daily. In spite of treatment the attacks recurred, although less frequently than before. In May 1951 he was still having bouts of tachycardia, but at no time was there evidence of congestive failure. The apex thrust was more heaving and had shifted laterally, indicating progressive dilatation of the left heart.

On July 21, 1952, he had three attacks, and on July 23, one attack which lasted over 24 hours and was associated with severe dyspnœa and hydrothorax. The patient was hospitalized and treated with digitalis (Cedilanid C intravenously), whereupon he had a brief episode of fibrillation alternating with regular rhythm. Eventually the fibrillation became dominant and was controlled with 0.2 mg. digitoxin daily.

SUMMARY

We have a patient with attacks of paroxysmal tachycardia of nodal origin with a rate that varied between 146 and 150. Quinidine was ineffective. In retrospect, although there was final evidence of congestive failure, I now feel that each of these attacks indicated a deterioration of the myocardium rather than that the heart failure was caused by the recurrent attacks of paroxysmal tachycardia. The first attack followed in the progress of the valvular disease, and then with the increasing ventricular dilatation there was an increased number of paroxysmal episodes. I feel that the patient should have been treated with digitalis from the beginning.

Fig. 1 shows the tracing in 1949 and one episode of paroxysmal tachycardia in July 1950. The P wave may be seen in the ascending limb of S. The tracing indicates a middle nodal rhythm.

CASE 2.—This 60-year-old man was first seen in July 1951. He gave a history of attacks of paroxysmal tachycardia from April 1951 onward. Eventually one of these attacks was recorded. The electrocardiogram in the intervening free period was completely normal and the history not helpful. On examination he had a blood pressure of 160/86 mm. Hg and a moderate hypertrophy of the heart by radiological examination. During this attack the rate was found to be 150 and it was classified as of nodal origin. The patient was digitalized and kept on 0.2 mg. digitoxin daily. It was only when he stopped digitalis two years later that another attack occurred.

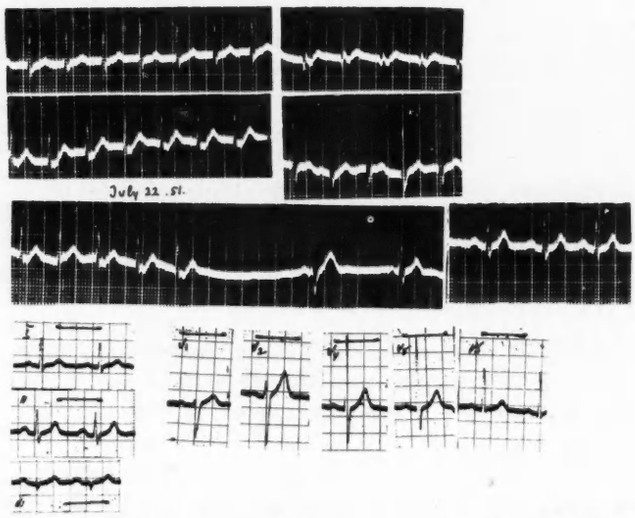

Fig. 2.—ECG from Case 2 demonstrates the effect of carotid pressure on an attack of paroxysmal tachycardia. The second tracing was taken one day later.

Fig. 2: The P waves follow the QRS complex (lead II and III), RP being 0.08 - 0.1 sec. It indicates the presence of a lower or middle nodal rhythm with delayed retrograde conduction. The electrocardiogram in the interval is of normal appearance.

SUMMARY

We have here a case with attacks of paroxysmal tachycardia of nodal origin and a rate of 150. In spite of the fact that there was no definite evidence of myocardial weakness or failure, he was digitalized and had no recurrence of the attacks while taking digitalis.

CASE 3.—A 64-year-old woman was first seen in September 1955 with severe dyspnœa and wheezing. The blood pressure was 210/110 and the heart rate varied between 150 and 166. There was evidence of congestive failure.

On her admission to hospital, the tracing was first considered as indicating a sinus tachycardia. However, after she was given only two ampoules of 0.04 mg. Cedilanid C intramuscularly, the rate returned to 78. The tracing was then reviewed and recognized as indicative of an attack of nodal paroxysmal tachycardia. Thereafter only 0.1 mg. digitoxin was given daily. The patient suffered another attack 18 days later, with a rate of 150. While it was not possible to record the

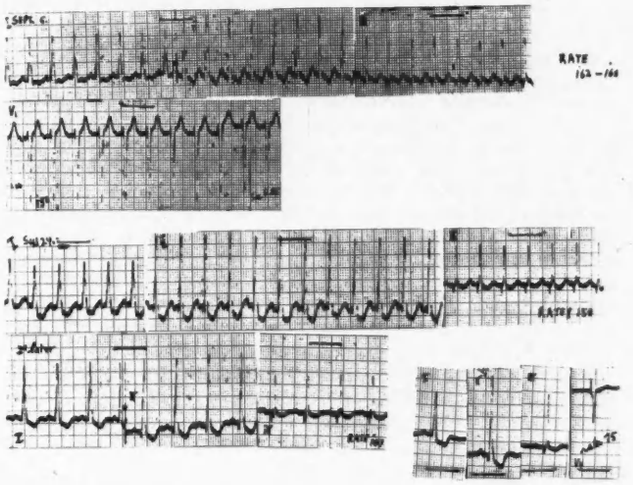

Fig. 3.—ECG from Case 3. Upper: attack of paroxysmal tachycardia with a rate varying between 150 and 166. Lower: 18 days later with a rate of 150 and return to sinus rhythm immediately afterwards. The tracing at lower right-hand corner was taken after treatment.

transition from nodal rhythm to sinus rhythm by carotid pressure, return to sinus rhythm with a rate of 107 was finally obtained. After correct digitalization and maintenance on a much higher dose (0.2 mg. digitoxin eight times weekly), no further attacks were reported over a three-year period. Eventually the patient died of carcinoma of the liver.

Fig. 3: The PR interval is 0.08 sec. Presumably the auricular impulses spread like the sinus impulse, but arise from the part of the AV node nearest to the tail of the sinus node, around the mouth of the coronary sinus (coronary nodal rhythm). The tracing is abnormal inasmuch as the ST spaces are depressed.

SUMMARY

This case is one of nodal paroxysmal tachycardia, relapsing when inadequately treated. On proper therapy a satisfactory outcome was obtained.

CASE 4.—A 65-year-old woman when first seen in 1953 complained of attacks of rapid heart beat that came on suddenly and stopped abruptly. The physical examination was negative apart from the fact that she had some hypertension. The electrocardiogram was normal. The first attack was recorded in November 1954, the tracing showing a rate of 250 (Fig. 4a).

In March 1958, she had a retinal hæmorrhage in her left eye; blood pressure then was 190/110 mm. Hg and the heart rate was 90. She complained of shortness of breath, and during the consultation she had an attack of tachycardia, tracing of which showed a rate of 130 (Fig. 4b). Carotid pressure stopped the attack. The electrocardiogram shows inverted P waves, a PR

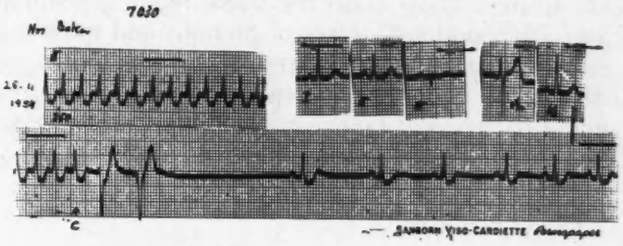

Fig 4a.—ECG from Case 4 showing an attack of auricular paroxysmal tachycardia with carotid pressure effect and a tracing taken during an intervening free period at the upper right-hand corner.

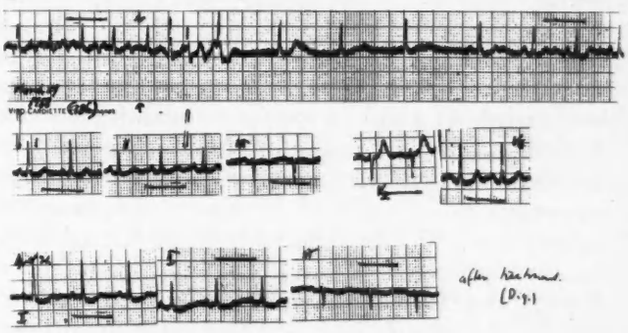

Fig. 4b.—ECG from same case four years later showing an attack of nodal paroxysmal tachycardia arrested by carotid pressure. The second tracing was taken immediately after cessation of the attack, the lower one after treatment.

interval of 0.24, and an RP of 0.20 sec. An upper nodal rhythm with delay in forward conduction was the most likely cause of the disorder. Against the assumption that the tachycardia could be the result of a continued reciprocal rhythm with a repetitive re-entry of the impulse within the AV node is the fact that the RP is only 0.20 (not long enough to favour conditions for the initiation of such a mechanism). The inverted P evidently originated in the upper portion of the node with delay in forward conduction.

It should be pointed out that in November 1954 the tachycardia was of the auricular type. With the appearance of myocardial damage the tachycardia changed to the nodal type and responded well to digitalization.

DISCUSSION

While it is common knowledge that paroxysmal tachycardia is encountered in a great number of people without heart disease, so that it has been considered more of an "inconvenience than expression of heart disease",[1] the reported observations suggest that whenever an attack of nodal paroxysmal tachycardia is encountered the possibility of latent heart disease should be considered. It may well be that such attacks indicate myocardial deterioration. Early detection is important because prevention of recurrences seems essential.

While a good number of cases with myocardial failure do very well on a maintenance dose of digitoxin, this type of paroxysmal tachycardia is best prevented by larger doses. Digitalis is known to decrease or impair the conduction of impulses from the atrium to the ventricle, partly by vagal stimulation but predominantly by direct action on the junctional tissues in the myocardium. Gold

et al.[2] have shown that the vagal factor predominates after moderate doses of digitalis and the extravagal factor after large doses. It appears that vagal stimulation is insufficient to control the rhythm of nodal paroxysmal tachycardia. Similar observations may be made in cases of auricular flutter.

CONCLUSION

Clinical observation would seem to justify a separation between the auricular and nodal paroxysmal tachycardias. While cardiovascular abnormalities are usually not encountered in cases where the rate of acceleration of the ectopic focus is rather high (as in supraventricular paroxysmal tachycardia), patients who show the "nodal" type (with a rate of 140-160) may have manifest or subclinical cardiac disease. Attention is focused on the fact that in these cases a paroxysmal attack may even be considered an early symptom and indication of further deterioration of the underlying myocardial disease, not apparent in our usual clinical observation. In view of the fact that prevention of a paroxysm is of paramount importance and well-balanced digitalis therapy will prevent recurrence, such a distinction should be kept in mind as an aid in early recognition of subclinical myocardial disease.

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RÉSUMÉ

L'observation clinique justifie la différenciation des tachycardies auriculaires et nodales. Bien qu'on voit rarement d'anomalie cardio-vasculaire dans les cas où le taux d'accélération d'un foyer ectopique est élevé (comme dans la tachycardie paroxystique supraventriculaire) les malades qui présentent une tachycardie du genre nodal à un taux variant de 140 à 160 peuvent être porteurs de lésion cardiaque occulte ou ouverte. Remarquons que dans ces cas, une attaque paroxystique peut même être considérée comme un symptôme précoce d'atteinte myocardique et une indication de détérioration organique plus avancée, inaperçue à l'observation clinique habituelle. Puisque la prévention des paroxysmes est d'importance primordiale et qu'une thérapie digitalique peut prévenir ces récidives, le dépistage précoce des maladies cardiaques sous-cliniques devrait être possible lorsqu'une telle distinction est présente à l'esprit.

THE USE OF GLUTETHIMIDE (Doriden) IN OBSTETRICS

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GLUTETHIMIDE (Doriden*) is a new non-barbiturate hypnotic agent (Fig. 1), with a negligible effect on the respiratory system. It has been reported by various authors to be an effective sedative and hypnotic, and for this reason a study was undertaken of the use of glutethimide in various aspects of the field of obstetrics.

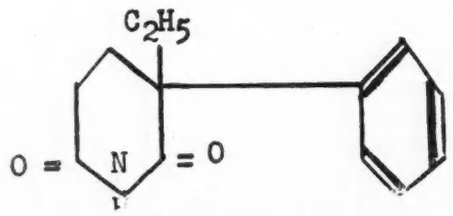

Fig. 1.—*a*-ethyl, *a*-phenyl glutarimide.

REVIEW OF LITERATURE

Gross, Tripod and Meier[5] have examined in some detail the pharmacological action of glutethimide in comparison with that of phenobarbital and methylpentynol (Dormison). They showed that, in duration of effect, glutethimide corresponded approximately to methylpentynol, but had a considerably greater intensity of action. Qualitatively its action was similar to that of phenobarbital, but the duration of its effect was less. Glutethimide was shown to have anticonvulsive properties against convulsions produced by different means, its intensity of action ranging between that of phenobarbital and methylpentynol. Doriden and phenobarbital diminished the toxicity of metrazol and nikethamide in about the same manner, but diminished that of caffeine and amphetamine only slightly. In this experimental arrangement also, methylpentynol had a considerably weaker action than the other two substances.

In contrast to phenobarbital, glutethimide did not impair spontaneous respiration even in larger doses, and diminished oxygen consumption less than phenobarbital did. No hypotensive action appeared in animal experiments. The body temperature was not influenced. Various authors have reported on the efficacy of glutethimide as a general sedative and hypnotic.[7, 9, 10, 12-15]

Several authors have also described their experience with glutethimide as an agent in preanæsthetic medication. Logan,[11] in a study of 60 patients, achieved satisfactory results with a preoperative routine of 1.0 g. of glutethimide at bedtime, 1.0 g. one and one-half hours before and 0.5 g. one-half hour before call to the operating room, with 1/150 grain of atropine intramuscularly at the time of the last dose. Postoperative complications were minimal, no respiratory depression was

*T.M. regd. name.

noted, and there was freedom from postoperative gaseous distension. Similar results were reported by Hodge *et al.*[6] in a study of 75 patients; by Burros and Borromeo[3] in an evaluation of glutethimide in 60 patients undergoing cystoscopic procedures; and by Branch and Pastorello[2] in a study involving 118 children ranging in age from 2 to 15 years.

Abbas[1] reported on the use of glutethimide in 100 women in labour. He concluded that glutethimide was an effective sedative when administered in early labour, that it greatly reduced the requirements of meperidine (Demerol) for analgesia and additional sedation, and that it produced no evidence of any maternal or fetal hazard. Crisp[4] reported similar results briefly, in a series of 38 patients.

Methods

The present study is concerned with the use of glutethimide in obstetrics. Its use as a hypnotic was evaluated during the period of pregnancy, and in the special conditions of nausea and vomiting of pregnancy, hypertension of pregnancy and threatened abortion. In addition, the use of glutethimide was evaluated during the first stage of labour, particular attention being given to the degree of relief of pain, relaxation and general condition of the patient, the fetal heart rate, the necessity for additional medication, the effect on the progress of labour, and the effect on the newborn. Evaluation was on the basis of clinical impression, and in certain areas control groups were used as indicated below.

RESULTS

1. *Before Onset of Labour*

(a) *Insomnia*

James[8] has stressed that one of the earliest manifestations of a psychotic state in pregnancy is insomnia. The 50 patients who presented at the prenatal clinic with this complaint were treated with 0.5 g. of glutethimide at night, with the following results: good effect, 36 (72%); slight effect, 8 (16%); no effect, 6 (12%).

No attempt was made to increase the dosage. No side effects were noticed, except for a sensation of "heaviness" in the morning, reported by three patients (6%). No symptoms of addiction were noted, although the drug was prescribed every night over a period of from three to six months.

(b) *Nausea and Vomiting of Pregnancy*

Ten patients with persistent vomiting in the early stages of pregnancy were treated with glutethimide, 0.25 g. twice daily. None of these cases had responded to either antihistamines or the combination of antihistamines and vitamins. The results in this small group were uniformly good. In one in whom symptoms persisted after the 13th week of pregnancy it was noted that emesis returned as soon as the treatment with glutethimide was stopped. This case was treated up to the 21st week with a dose of 250 mg. twice a day and at that stage withdrawal of the drug was not followed by emesis. The average period of treatment was six weeks, i.e. from just after the first missed period up to the 11th or 12th week of amenorrhœa.

(c) *Hypertension of Pregnancy*

During the first trimester, patients with a blood pressure of 140/90 without other symptoms were treated with 0.25 g. of glutethimide twice daily. The response was variable. There were 13 patients in this series, five of whom responded with a return to normal values (120/80). Of the remaining eight, three had a lowering of their blood pressure to normal values when reserpine 0.25 mg. b.i.d. was employed. Hypertension observed first in the middle or third trimester did not appear to be affected by this drug.

(d) *Threatened Abortion*

Ten patients with symptoms of a threatened miscarriage were treated with 0.25 g. of glutethimide twice daily during the episode of bleeding and for seven days after cessation of bleeding. Comparison was made with a group of 10 patients treated with one grain of phenobarbital twice a day. No difference was seen between the two groups except that patients taking glutethimide complained less of side effects, e.g. uncomfortable drowsiness, than those taking phenobarbital. Complete bed rest was ordered for all patients.

2. *Use of Glutethimide During Labour*

(a) A total of 50 patients (30 primigravidæ and 20 multiparæ) received glutethimide early in the first stage of labour, once labour was well established, and in the presence of cervical dilatation of at least one finger's breadth. The initial dose was 0.25 g. followed by 0.25 g. q. 4 h. The results are shown in Table I.

TABLE I.—GLUTETHIMIDE IN FIRST STAGE OF LABOUR

	Subjective results	*Objective results*
Good	35 (70%)	38 (76%)
Fair	7 (14%)	7 (14%)
Poor	8 (16%)	5 (10%)

Criteria:

Subjective—
Good: pain and discomfort alleviated.
Fair: some relief noted.
Poor: no relief noted.

Objective—
Good: physical and mental relaxation.
Fair: restlessness persisting during contractions.
Poor: restlessness throughout labour.

(b) *Effect on Progress of Labour*

The effect of glutethimide on the progress of labour was compared with the effect of a mixture

of potassium bromide and chloral hydrate in a control group.

In both groups all presentations were vertex. The incidence of forceps delivery was equal in both groups and there were no indications in the survey that the drug delayed labour in any way.

The first stage of labour seemed shortened. Abbas[1] has suggested that this is due to the rapid cervical dilatation effected by the calming and relaxing properties of the drug. The average times are given in Table II.

TABLE II.—GLUTETHIMIDE AND THE PROGRESS OF LABOUR

	Glutethimide group	*Control group: potassium bromide 15 grains chloral hydrate 15 grains*
1st stage	14 hours (primigravida) 6.75 hours (multipara)	15.75 hours (primigravida) 8 hours (multipara)
2nd stage	1.1 hours	1.4 hours
3rd stage	15 minutes	18 minutes

There was no difference in the incidence of post-partum hæmorrhage in the two groups.

(c) *Need for Additional Analgesia*

The amount of alphaprodine (Nisentil) administered to the control and glutethimide-treated groups is recorded in Table III. Since the clinical evaluation of pain is very difficult, it may not be possible to draw definite conclusions from these results. It will be seen however that whereas 37 patients in the control group (treated with a mixture of potassium bromide and chloral hydrate) required 60 mg. of alphaprodine twice during labour, only 20 patients receiving glutethimide required the same quantity. In our hospitals, 120 mg. represents the average dose of alphaprodine needed during labour (irrespective of obstetrician, parity, etc.).

TABLE III.—NEED FOR ADDITIONAL ANALGESIA

Glutethimide group				
		Alphaprodine requirements		
Dose of glutethimide	*No. of patients*	*None*	*60 mg.*	*120 mg.*
0.5 g.	22	2	8	12
0.75 g.	18	2	9	7
1.0 g.	10	3	6	1
Totals	50	7	23	20

Control group				
		Alphaprodine requirements		
*Dose of mixture**	*No. of patients*	*None*	*60 mg.*	*120 mg.*
½ oz.	25	2	6	17
1 oz.	14	0	3	11
1½ oz.	11	0	2	9
Totals	50	2	11	37

*Mixture: Potassium bromide 15 grains, chloral hydrate 15 grains, aqua ad ½ oz.

(d) *Neonatal Effect*

Difficulty was experienced in arriving at satisfactory criteria but the impression of members of the staff and myself was that there was less depression of respiration in the glutethimide group than in the controls. The figures are not accurate (the recording of this factor was not always done by the same individual) and I have not quoted them.

SUMMARY

Glutethimide proved to be a useful hypnotic for controlling insomnia during pregnancy, and a good sedative for the treatment of nausea and vomiting of pregnancy. Its effect on mild hypertension encountered early in pregnancy was variable, and it appeared to be without effect in hypertension encountered during the middle or third trimesters. Its action in threatened miscarriage appeared to be comparable to that obtained in a similar group of patients with barbiturates.

During labour good physical and mental relaxation, with alleviation of discomfort and pain, were seen in approximately three-quarters of the patients treated with glutethimide. Labour appeared to be shortened, and less additional analgesic seemed to be required.

There appeared to be less depression of respiration in the newborn with glutethimide than with barbiturates.

Glutethimide was more palatable than a mixture of potassium bromide and chloral hydrate, and caused less gastric upset.

No deleterious effects were seen with glutethimide.

I should like to thank the Ciba Company Limited for the supply of glutethimide (Doriden) and to express my thanks to Dr. C. Walter Murphy and Mr. William Kingston of Ciba for their help. I wish to thank the staffs of the Obstetric Units, Grace Hospital, and St. Clare's Mercy Hospital, St. John's, Newfoundland, for their assistance.

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RÉSUMÉ

Le glutethimide est un hypnotique utile dans le contrôle de l'insomnie pendant la grossesse. Il est aussi un bon sédatif dans le traitement des nausées et vomissements de cet état. Au cours du premier trimestre, son effet sur la

petite hypertension est discutable; il ne paraît exercer aucune influence sur l'hypertension que l'on trouve dans les deuxième et troisième trimestres. Dans la menace d'avortement il agit de la même manière que les autres barbituriques. Au cours de l'accouchement il a semblé produire un bon relâchement physique et mental et soulager la douleur et la gêne chez environ trois-quarts des parturientes à qui on l'a administré. Les enfants nés de ces femmes ont semblé respirer plus librement que ceux des femmes à qui on avait administré des barbituriques. Le médicament fut bien toléré et ne produisit aucun effet fâcheux.

Case Reports

THE DANGEROUS HYPODERMOCLYSIS IN INFANCY*

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THE USE OF FLUID and electrolyte therapy has done much to save lives in many surgical and medical conditions. The injudicious use of these same agents, on the other hand, has on occasion cost some patients their lives. This communication is intended to call attention to a not infrequent cause of mortality and morbidity seen in hospital. It stems from the abandon with which fluids are ordered.

J.A.S., aged 13 months, weight 18 lb. 12 oz., was admitted to hospital with a history of diarrhœa for five days and vomiting of one day's duration. During the 24-hour period before admission, she had approximately ten liquid bowel movements and had vomited all feedings. She had voided before admission. Physical examination revealed a moderately dehydrated child in no apparent distress, but tired and listless.

A hypodermoclysis of a mixture of three parts of 5% glucose in water to two parts of distilled water was administered, the child receiving a total of 740 c.c in eight hours. Oral glucose was also given and retained during this period.

Six hours after admission she began to twitch in all four limbs and then had a generalized convulsion. Paraldehyde and sodium Luminal (phenobarbital) were given intramuscularly with no cessation of seizures. The temperature rose to 105° F. Examination of the cerebrospinal fluid at that time gave normal values for cells, protein and sugar. Serum electrolyte values, determined for the first time, were: chloride 103.3 mEq./l. and sodium 125.3 mEq./l. The leukocyte count was 25,200 per c.mm.

An intravenous infusion of 100 c.c. normal saline was given over the next two hours and then 250 c.c. of triple strength saline. Three hours later infusion of a hypotonic multi-electrolyte solution was started at the rate of 30 c.c. per hour. Serum electrolyte values at this time were: Na 137.5 mEq./l., Cl 120 mEq./l., CO_2 5.2 mEq./l., pH 7.15 and BUN (blood urea nitrogen) 58.8 mg./100 c.c.

She continued to have episodes of twitchings for the next eight hours, involving all four limbs and facial muscles, the temperature remaining elevated between 103° F. and 105° F. during this time.

A catheter specimen of 10 c.c. of urine was obtained 17 hours after admission, the first urine recorded since admission. The reaction of the urine was acid and it contained 4+ albumin. A second specimen collected at 24 hours, amounting to 39 c.c., was acid in reaction, contained 2 g. of Cl and 1 g. of albumin/100 c.c.

The child's condition gradually deteriorated over the next few hours; she had remained comatose since the onset of the convulsions. Salt free albumin 75 c.c. and 1/6 molar sodium bicarbonate solutions were added to her intravenous fluids but she died 36 hours after admission. Permission for autopsy was refused.

DISCUSSION

The patient died of anuria precipitated by fluids administered subcutaneously. This does not condemn the use of subcutaneous or intravenous fluids, as this child required fluid and electrolyte therapy. It, however, does condemn the wrong choice of fluids by the wrong route.

Lowered urine output in acute diarrhœa of infancy, with loss of body fluids and electrolytes (mainly Na, K and Cl), stems from a diminished circulating volume. Urine flow can be restored almost in every instance by the use of intravenous solutions, which will expand the circulating volume and thus increase renal blood flow. With the return of renal function, the kidney (the world's best biochemist) will sort out the electrolytes and fluids for the physician (usually the world's worst biochemist) and all will go well. However, if, during the phase of lowered plasma volume, lowered renal blood flow and, therefore, lowered urine output, one creates an extra space by giving hypertonic fluids by clysis, the plasma volume will be further compromised by fluid leaving the vascular space to enter the site of the clysis (due to the higher osmotic pressure of the subcutaneous fluids). With the decrease in the plasma volume, the renal blood flow will be further depressed and anuria will result.[2-6] The use of fluids low in electrolyte content by clysis will also precipitate shock and resulting anuria, as electrolyte leaves the vascular space to come into equilibrium with the subcutaneous pool.[6]

Abbott[1] several years ago demonstrated the effect of subcutaneous fluid therapy on the urinary output in postoperative and normal persons. He showed that invariably the serum electrolyte values

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TABLE I.—STUDIES ON A 15-KG. CHILD DEMONSTRATING THE EFFECTS OF CLYSIS OF VARIOUS COMPOSITION

Clysis	*Urea clearance*		*Serum protein*		*Na*	
	Before	*After*	*Before*	*After*	*Before*	*After*
300 c.c. of 5% glucose and water	82%	35%	6.9	7.6	139	133.3
As above with hyaluronidase	73	38	6.9	8.1	138	134.0
10% Travert in water, 300 c.c	81	27	6.8	7.8	125	121.7
Half strength saline, 300 c.c.	82	76	6.7	7.2	131	134.0

fell, urine flow diminished and plasma protein values rose, indicating loss of fluid from the vascular space.

In a similar experiment outlined in Table I we have demonstrated essentially the same findings as Abbott.

It will be noted in each of the first three instances that the urea clearance fell (an approximate measure of glomerular filtration rate), the serum sodium level fell and the serum protein levels rose, all indicating shrinking circulating volume and crystalloid loss from the vascular space to equilibrate with the subcutaneous pool.

As a corollary of the above, one would advise use of solutions by the intravenous route only. This is easily achieved in childhood, seeing that scalp veins are readily available for venipuncture, and if one fails here the saphenous veins are readily reached by cut down. It is surprising how the surgeon tackles an abdominal cancer but shudders at the "cut down" to puncture the saphenous vein of a child. If a solution must be used by hypodermoclysis, it is obvious that it should be isoosmotic with the plasma and be of the same salt content. At the Children's Hospital of Winnipeg we advise this simple routine for therapy in severe dehydration with oliguria:

(a) All fluids are given by vein.

(b) No potassium is given until urine flow is established.

(c) All regimens are started with fluids containing Na, Cl, and lactate ions. The Na and Cl are in concentrations half that of extracellular fluid. This is made up by mixing normal saline with 1/6 M. lactate and glucose in water in proportions of 1 part of 1/6 M. lactate, 2 parts saline and 3 parts of glucose in water; 15 c.c. per kg. of this mixture is run in quickly (in one hour) to expand the vascular space. This will establish urine flow in almost all instances and be quite safe in the face of hypernatræmia.

(d) When urine flow is established, hypotonic multi-electrolyte solutions (there are many commercially available) are run in to make up a total of 150 c.c./kg./day. These solutions contain potassium in concentration above that of the extracellular fluid.

If the patient fails to pass urine (c), the intake must be carefully regulated according to the loss through skin, bowel and lungs and requires careful laboratory monitoring in a well equipped medical centre.

The use of clysis may be permissible if all other routes of administration fail; then, only solutions isotonic with the plasma and with a Na and Cl content equal to the extracellular fluid may be used.

The case reported is truly one of death by clysis.

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AVIAN TUBERCULOSIS IN THE HUMAN*

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AUTHENTICATED cases of avian tuberculosis in man are extremely rare. While avian tuberculosis is very common in chickens, up to 10% being infected, Feldman[1] in reviewing the literature up to 1938 found that of 37 cases of human avian tuberculosis recorded, only 13 had been sufficiently investigated to be acceptable as proven cases. There has been very little discussion on the subject in the medical literature since that time.

The case being presented is that of an Italian immigrant who came to Canada in February 1955. She was born in 1928, is married and has no children. Family and personal history are negative. Functional enquiry is negative and she appears healthy. This patient had worked four to five months in Vancouver for a poultry company, eviscerating chickens. It is apparently impossible to avoid scratches on the hands and wrists while eviscerating poultry. About December 20, 1955, she noticed a scratch on her right arm just above the wrist, which did not heal as rapidly as other scratches had done. Within a short time of the appearance of the lesion on the right forearm, the patient developed a low-grade infection of the lymph nodes in the right

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A complete report of the bacteriological investigations in this case will be published later by the laboratories.

axilla, as shown by redness, tenderness and palpable axillary lymph nodes.

On January 15, 1956, she was admitted to St. Paul's Hospital, Vancouver, by Dr. P. Ragona, and an incision and drainage of the right axillary lymph nodes was performed. A culture was taken of the pus, and after eight weeks' incubation in the Provincial Laboratory a definite growth of acid-fast bacilli, not typical of the human strain of *Mycobacterium tuberculosis*, was found. It was at this point that the probability of avian tuberculosis was raised by Dr. C. E. Dolman, Director of Provincial Laboratories, and Dr. Ragona.

After initial isolation of the acid-fast bacillus from this case, a culture was sent to the Animal Diseases Research Institute of the Federal Department of Agriculture, Hull, Quebec. Extensive studies were carried out by Dr. H. Konst to determine the cultural and morphological properties of the bacillus, its pathogenicity in various animals and tuberculin allergy tests on the animals inoculated.

Laboratory Investigation

The laboratory identification of the avian strain of tuberculosis requires extensive investigation. Briefly, it may be stated to consist of cultural studies of the originally isolated bacilli and those subsequently recovered from the inoculated laboratory animals on various types of media, and comparison of the recovered strain with standard strains of avian *Myco. tuberculosis*.

Studies of pathogenicity involve a considerable number of animals such as chickens, rabbits, guinea pigs and mice, which are inoculated with the cultured material by various routes, such as intravenously, intraperitoneally, and subcutaneously. Post-mortem examination of these animals is carried out to determine the presence of the bacilli in the various organs of the body; they are usually found in the lungs, liver, spleen, kidneys and other organs.

Allergy Tests

In allergy testing, animals previously inoculated with the organisms under investigation and surviving a suitable time after inoculation are subjected to comparative intradermal studies with avian and bovine tuberculin in varying dilutions. If avian tuberculosis is present, the response to the avian tuberculin should be much more marked than that to the bovine tuberculin.

Comparative intradermal tuberculin tests were performed on the patient, using avian tuberculin provided by the Animal Diseases Research Institute and human tuberculin of standard type. The test consisted of an intradermal injection of 0.10 c.c. of avian tuberculin containing 0.029 mg. in the right forearm and simultaneous injection of 0.10 c.c. of human tuberculin containing 0.024 mg. O.T. (i.e. 0.10 c.c. of 1:400 O.T.) into the left forearm. When these tests were read at 48 hours and 96 hours, there was a marked reaction to the avian tuberculin and a negative response to the human tuberculin. At the site of the avian tuberculin injection there was an area of induration measuring 7.5 cm. in diameter which was red and painful. However, at no time did this ulcerate and it gradually resolved in about one month. Coincidentally the patient developed redness and tenderness in the right axilla but this was self-limited and gradually subsided, much like the intradermal reaction. There was no reaction in the left axilla.

Criteria for Diagnosis

The extreme rarity of infection of human beings with avian tubercle bacilli makes it imperative that every diagnosis be established only after extensive investigation and with convincing data. The criteria[1] for diagnosis should be:

1. The isolation direct from the tissues of the subject of an acid-fast bacillus with the accepted cultural, antigenic and pathogenic characteristics of the avian tubercle bacilli.
2. The isolation of proven avian tubercle bacilli from the tissues of a laboratory animal previously inoculated with material from the subject; the laboratory animal should be free from all suspicion of spontaneous or accidental tuberculous infection.

Studies as outlined above were carried out by the Animal Diseases Research Institute of the Department of Agriculture, Hull. The results obtained indicated that the bacillus under investigation was comparable to the standard strain of avian tubercle bacillus in cultural and morphological properties.

The comparative response to intradermal avian and human tuberculin tests in the patient also provides further proof of avian tuberculous infection.

Clinical Course

Clinically this patient slowly improved. The abrasion on the wrist, the initial site of inoculation, healed in a few weeks and remained healed. In April 1956, enlarged lymph nodes also appeared in the left axilla, which later broke down and discharged, but the patient refused operation. There was no evidence of pulmonary or other forms of tuberculosis.

She was started on streptomycin and para-aminosalicylic acid in routine dosages in May 1956, and the lymph nodes diminished in size but did not disappear, while the sinus in the right axilla remained open. Isoniazid was added in January 1957, and the improvement was accelerated with healing of the sinuses, but the right axillary nodes were still palpable and enlarged to the size of a walnut at times. The left axillary nodes were smaller but palpable, and also varied in size. The response to tuberculous antimicrobials was not dramatic as regards healing of the glandular elements in this case, although the lesion at the site of inoculation and the axillary sinuses healed well.

However, in January 1958, the lymph nodes in the right axilla were again becoming quite large and the sinus in the right axilla broke down and discharged. Shortly afterwards the nodes in the left axilla began to enlarge again. The patient finally consented to admission to hospital for excision of the axillary nodes.

The left axillary nodes were removed on February 18, 1958, and after operation there was purulent drainage from this area for about four weeks, at which

time it finally healed. On March 28, 1958, the right axillary nodes were removed and the sinus was excised. There was a slight amount of purulent discharge from the incision, but the wound healed completely in about 10 days.

On admission to hospital the antimicrobials in this case were changed to Seromycin (cycloserine) and isonicotinic acid hydrazide.

The patient was discharged from hospital on April 19, 1958. On examination in July 1958, the patient's condition was satisfactory, the operative sites being well healed, and there was no recurrence of enlargement of lymph nodes.

The bacteriological investigation was repeated by the Animal Diseases Research Institute. Although pleomorphic acid-fast bacilli were demonstrated in some sections of the axillary lymph nodes, it was not possible to isolate these micro-organisms by culture or by animal inoculation. However, the patient had had prolonged antimicrobial therapy since the bacilli were originally isolated.

An interesting sidelight in this case was that the condition was considered to have occurred as a result of her occupation and she was paid Workmen's Compensation benefits for the period of her disablement.

SUMMARY

A human case of proven avian tuberculosis is presented. The criteria for diagnosis are outlined. The results of the investigations carried out to confirm the diagnosis are recorded. The clinical course of the disease is described.

The writer wishes to thank Dr. P. Ragona for permission to publish this case and the Pathology Department, Animal Diseases Research Institute, Hull, Quebec, for the extensive investigation carried out to confirm the diagnosis; also Dr. C. E. Dolman, Dr. E. J. Bowmer and Miss Josephine McDiarmid of the Provincial Laboratory, Department of Health and Welfare, Health Branch, Vancouver, who originally isolated the bacillus and did much subsequent investigation.

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SHOCK ASSOCIATED WITH INJECTION OF POSTERIOR PITUITARY EXTRACT*

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THE ADVERSE EFFECTS of certain extracts of the posterior pituitary gland on the cardiovascular system have been noted clinically and proved experimentally over the last 30 years. However, the extracts still enjoy some popularity, and it is thought that the description of a case of so-called "pituitrin shock" might serve to stress the dangers inherent in the use of these drugs.

A 38-year-old patient was admitted to hospital for her fifth Cæsarean section. Her first pregnancy, 11 years previously, had been terminated by section because of eclampsia. All her other pregnancies had been uneventful. Five years previous to her present admission, she had a cyst removed from her breast, and the following year a bilateral venous ligation. Both these operations were performed at another hospital. For the breast operation she had received intravenous thiopentone and had vomited for two days after the operation. She requested that this drug be not used for her present operation. All the other operations were performed under spinal analgesia. She gave no history of any other serious illness or any allergy, and on examination the only abnormalities found were bilateral varicose veins.

It was decided to use spinal analgesia for the Cæsarean section. She received meperidine (Demerol) 50 mg. and atropine, 1/150 grain, 60 minutes before operation, and arrived in the operating room with a blood pressure of 130/75 mm. Hg and a pulse rate of 82 with a regular rhythm. Vasoxyl 10 mg. was given by intramuscular injection, and 10 minutes later 12 mg. of a hyperbaric solution of Pontocaine was given intrathecally into the 2-3 lumbar interspace, with the patient in the sitting position. Immediately after the spinal anæsthetic she was put in the supine position, 100% oxygen was given by mask, and an infusion of 5% glucose in water started in the left arm. The patient was draped, and on testing skin sensitivity it was found that analgesia did not extend above the umbilicus. Lowering the head of the patient did not help. Blood pressure and pulse rate remained at pre-anæsthetic levels. It was decided to give the patient a general anæsthetic, and anæsthesia was induced and maintained with cyclopropane, ether and oxygen in a closed circuit with carbon dioxide absorption. A healthy female child was delivered. The operation ended uneventfully, but as the drapes were being removed, the patient's pulse and blood pressure became imperceptible and she became cyanosed. At this time she was receiving 100% oxygen and had a good tidal exchange. Weak heart sounds were heard with a stethoscope; they were regular at a rate of 120 per minute. The lungs were clear on auscultation, and lung expansion was good. The cyanosis was of a peculiarly intense type involving the whole body, and the arteriolar-capillary refill was immediate. Within a few minutes, gross œdema of the face and all four limbs was noted. On quickly recapitulating the steps of the operation it was found that the surgeon had injected posterior pituitary extract 5 i.u. into the uterine muscle immediately after extracting the infant. At this time the staff anæsthetist had left the room with the infant to check its vital functions, the surgeon had performed his usual procedure for Cæsarean section under spinal analgesia, and the anæsthesia resident left in charge of the case had not known of the proposed injection. It was decided that the condition of the patient was due to the posterior pituitary extract.

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Aminophylline 125 mg. was immediately given intravenously with no obvious effect, and then a noradrenaline drip (8 μg./ml.) started at 40 drops per minute. There was an immediate response and after some 10 minutes a blood pressure of 120/80 mm. Hg was obtained. This was maintained with a drip rate of 20 drops per minute. As soon as the blood pressure began to rise, the patient became fully conscious and asked reasonable questions about her baby. With the rise of pressure the cyanosis disappeared but the œdema remained. This latter disappeared over the next six hours, during which time it was necessary to maintain the noradrenaline drip in order to keep the blood pressure above 100 mm. Hg systolic. At the end of this time the œdema had largely gone, and discontinuance of the drug was not followed by a fall in pressure. Further recovery was uneventful and the patient was discharged from hospital on her eighth post-operative day.

When she came for her first postnatal office visit, intradermal sensitivity testing was performed. A sample of the posterior pituitary extract as used at operation was diluted one million times and 0.2 ml. of this dilute solution was injected intradermally on the anterior aspect of the right forearm. A control injection was performed on the left forearm. Within a few minutes a wheal developed on the test side, followed by a flare. In 10 minutes the wheal had reached its maximum of 2.5 cm. diameter and the flare extended over the whole forearm and arm up to the axilla. The patient complained of pruritus over the affected area. The control test was negative.

DISCUSSION

Many of the cases of "pituitrin shock" reported in the literature have occurred in anæsthetized patients, and cyclopropane has been singled out as a particularly dangerous agent to combine with the administration of the extract.[1] Parsloe *et al.*[2] have investigated this experimentally in animals, and have found on the contrary that deep cyclopropane anæsthesia protects the animals from the coronary constrictive effects of the extract. The shock picture, with or without angioneurotic œdema, has been described in association with ethylene and ether anæsthesia,[3] and in patients who have received no anæsthetic at all.[4-6] Simon and Ryder[7] have shown that extracts of the posterior pituitary do contain a substance capable of acting as an antigen, and that this substance is neither the vasopressor nor the oxytocic factor. Feinberg *et al.*[8] report the sensitization of a patient to ACTH, and it is interesting that their patient showed positive skin tests to posterior pituitary extract and to the so-called purified oxytocic and vasopressor factors. Histamine itself has little effect on the heart, but the clinical picture and electrocardiographic changes associated with allergic shock in humans bear a close similarity to those of coronary insufficiency and infarction.[9] The experimental work of Kellner and his co-workers[10] would suggest that these are due to a specific antigen-antibody reaction in the heart itself, and are independent of any alteration in the coronary blood flow.

In the cases described by Simon and Ryder[7] sensitization never occurred after the first injection, and in one case only after the ninth injection. In the patient presently described sensitization had evidently occurred at the fourth injection, as she had received the drug for all her previous sections.

In view of these facts, it would probably be wise to abandon the use of posterior pituitary extract in those patients who have previously had the drug, unless preliminary skin testing indicates non-sensitization. Furthermore, the possibility of anaphylactic shock must be borne in mind when injections of any factor of either the anterior or posterior pituitary are undertaken in patients who have previously received injections of material from this gland. The anaphylactic shock may occur with or without the concomitant use of an anæsthetic. It is doubtful whether cyclopropane or any other anæsthetic agent plays any significant role in the production of this shock.

I would like to thank Dr. G. M. Bailey for permission to publish the case, and Dr. P. E. O'Shaughnessy for his help in handling the emergency.

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INTERSTITIAL PLASMA-CELL PNEUMONIA*
REPORT OF A CASE DIAGNOSED DURING LIFE

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THE PURPOSE of this paper is to record what the authors believe to be the first case on this continent of interstitial plasma cell pneumonia diagnosed during life and confirmed post mortem.

Since its first description in 1938,[1] interstitial plasma-cell pneumonia has received much attention in European literature. Deamer and Zollinger[2] in 1953 were the first to report on this disease in the North American literature. They cited 35 fatal cases seen at the Institute of Pathology of the University of Zürich. The first recognized case in

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North America was that of Lunseth *et al.*[3] in 1955. Gagné and Hould[4] in 1956 reported the first cases from Canada. Recently Eberling and Cohen[5] published a case in which the interstitial plasma-cell pneumonia was suspected just before death, after six weeks of hospital treatment. So far 14 cases have been observed[6-8] on this continent and these were all cases diagnosed post mortem.

History:

M.B., a white male infant, 3 months of age, was born at another hospital at eight months' gestation, product of the fifth pregnancy of healthy parents. Labour was normal, birth weight 2778 grams. Initiation of respiration was slow; oxygen was required and maintained for six days because of cyanosis; the Moro reflex was absent, vomiting was frequent and generalized seizures recurred in the early weeks. The chest radiograph was normal at nine days. Antibiotics were given because of a diagnosis of otitis media, and transfusions because of anæmia. At the age of two months spinal fluid examination was negative. He was discharged from the nursery to his home at the age of 68 days with a diagnosis of brain damage. At home, from the 68th to the 107th day of life, he was hypertonic and vomited frequently. Because of cyanosis of hands, feet and face of two days' duration he was admitted to the Royal Victoria Hospital on November 16, 1956, at the age of three months.

Physical Examination

He was a small, poorly nourished male infant with grey-bluish cyanosis of face, hands and feet and in marked opisthotonos. Temperature 99.6° F., weight 3171 g. Head circumference 35 cm., fontanelle of normal size and soft. Rotary nystagmus of both eyes, pupils equal, responsive to light. Normal fundi with pale discs. Hypertonicity of all extremities, brisk deep tendon reflexes, absent grasp and Moro reflex. Respiratory rate 27, pulse rate 184. Lungs and heart were normal to percussion and auscultation. The remainder of the examination was negative except for cutdown scars on arms and legs from previous transfusions.

Laboratory Findings

Hb. 11 g. %, W.B.C. 15,000, granulocytes 11,300, lymphocytes 3000, monocytes 700. Urine normal. Spinal fluid contained 71.2 mg. % proteins but was otherwise normal. Admission chest radiograph report: films of poor technical quality; no abnormality of lung fields seen.

Course in Hospital

The patient's condition remained poor. He took little formula and vomited frequently. Opisthotonos persisted, as did the grey-bluish cyanosis, but oxygen relieved cyanosis markedly. Respiratory rate ranged between 25 and 35 and pulse rate ran from 140 to 160. There was no fever. On the third day (November 19) several fine rales were present over base of right lung posteriorly. Repeat chest film at that time showed a typical picture of interstitial plasma-cell pneumonia (Fig. 1). The patient died the following night.

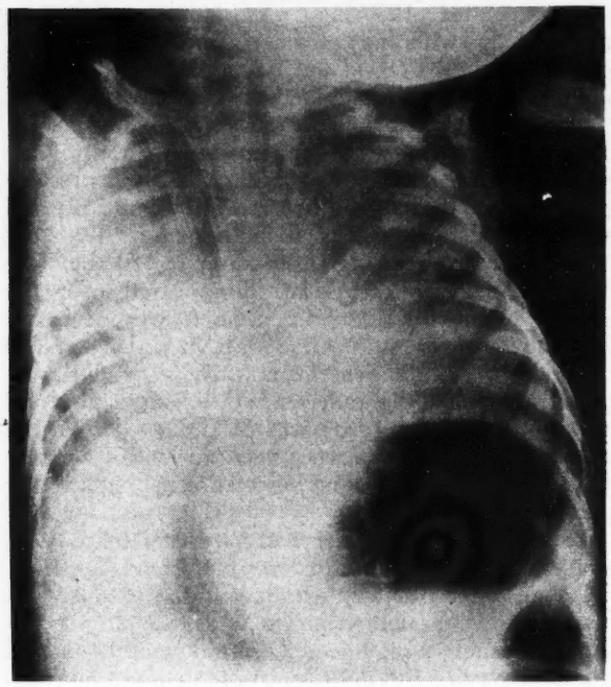

Fig. 1.—Chest radiograph, November 19, 1956: Considerable rotation but uniform increase in density throughout both lungs recognizable, giving impression of "ground-glass appearance".

Pathological Findings

The child was poorly developed and malnourished. The combined weight of the lungs was 177.1 g. (normal 60 g.). Both were moderately well expanded and the pleuræ were normal. The parenchyma was firm, dry and red-brown. Histological examination showed widespread interstitial pneumonia in which plasma cells were numerous, together with lymphocytes, with confluent foci of acute bronchopneumonia. Most of the alveoli contained macrophages and granular proteinaceous debris; a few contained aggregates of typical *Pneumocystis carinii* organisms, forming masses of acidophilic foamy or honeycomb-like material with little accompanying intra-alveolar inflammatory cell component (Figs. 2 and 3). There was severe encephalomalacia, affecting the cerebral hemispheres with cystic transformations. The encephalomalacia was thought to be due to ischæmia caused by birth trauma.

There was satisfactory histological evidence for the presence of *Pneumocystis carinii*, though its significance was uncertain. While it may be assumed that the organism was widely distributed through the lungs, evoking a vigorous macrophage reaction together with an interstitial mononuclear cell infiltrate, the morphological evidence for this was equivocal. Characteristic foci of organisms were small and scattered and phagocytosed organisms not demonstrable. Indeed, the most typical foci of organisms lacked an intra-alveolar inflammatory cell component. It would seem reasonable to conclude that the organisms in such foci had failed to elicit an intra-alveolar inflammatory response, and that they were either non-chemotactic primary invaders or possibly non-irritative secondary invaders in lungs already extensively involved by an interstitial pneumonia of unknown etiology and by an acute bronchopneumonia. The apparent dissociation of the larger masses of organisms and the cellular inflammatory response remains unexplained.

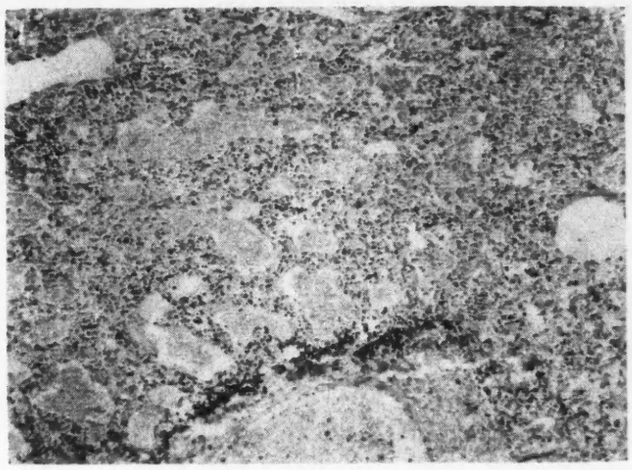

Fig. 2.—Histological section of lung. Note the interstitial mononuclear cell infiltration and foamy intra-alveolar exudate (× 80).

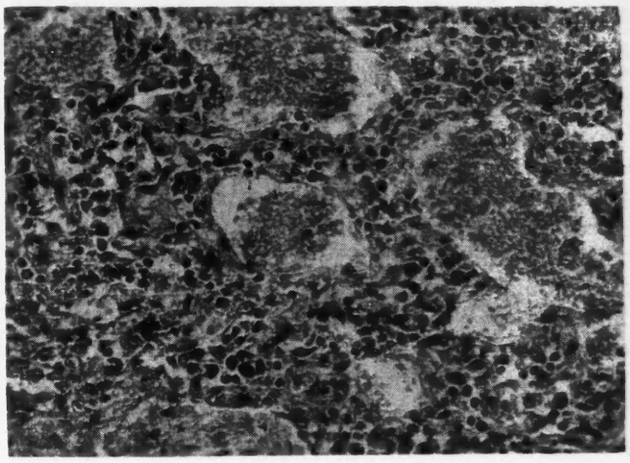

Fig. 3.—Histological section of lung. Foamlike intra-alveolar exudate containing *Pneumocystis carinii* (× 256).

DISCUSSION

Since several excellent papers on interstitial plasma-cell pneumonia have been published in recent years,[9, 10] any detailed description would be superfluous at this time.

The history and clinical findings in this case made us suspect intracranial disease superimposed on pre-existing brain damage. The cyanosis, however, was difficult to explain and the appearance of fine rales was the first indication of pulmonary disease. The repeat chest radiograph on the third day, showing extensive bilateral lung involvement, was recognized by one of us (P.W.J., who had seen several cases in Germany) as typical of interstitial plasma-cell pneumonia. (On review of the admission chest radiographs, characteristic changes were detected in retrospect.) The gross discrepancy between physical and radiological signs, the greybluish cyanosis, absence of fever and of marked leukocytosis in a premature, dystrophic, brain-damaged, three-month-old infant led to correct diagnosis, although the otherwise typical tachypnœa and dyspnœa were absent.

Since the incubation period is generally reported to be 4-6 weeks,[9, 10] and since the disease is prone to occur in premature nurseries, one assumes that the infection was probably acquired in the newborn nursery (although we have no data of other cases having occurred in that milieu). The acute bronchopneumonic changes were most probably due to superinfection, which seems to be very common.[9] The brain damage was thought to be due to anoxia; Ahvenainen[11] has also reported a case after cerebral birth injury. There is also evidence that interstitial plasma-cell pneumonia can affect the central nervous system in the form of meningo-encephalitis.[12-14] Hallmann and Ylppö[15] found a high incidence of mental retardation in a follow-up study of 31 children, especially among those who had marked hypercalcæmia during the acute disease.

Pneumocystis carinii was suggested as the etiological agent of this infectious disease by Vanek and Jirovec[16] in 1952. Most authorities are in agreement with them, although there still is some difference of opinion as to the taxonomic classification of the micro-organism, which is considered by most workers to be a protozoon. Ladstätter[17] was able to produce a disease similar to that in infants by inoculating *Pneumocystis carinii* into newborn mice and cats, and thus see Koch's postulate fulfilled. Vivell *et al.*,[18] using extracts from lungs of infants dying of interstitial plasma-cell pneumonia, demonstrated antibodies by complement fixation. They regard a titre of 1:4 as positive. Positive results are reported in 86 to 100% by investigators with several large series. Between 9 and 37% of exposed but clinically well infants and nursing personnel had antibodies. However, only 1.4 to 6% of a random infant and adult population had positive titres. These figures seem to indicate the existence of subclinical infection and a carrier state. Jahn and Roller-Gusinde[19] therefore recommend a complement fixation test for all nurses before their employment in premature nurseries. They also were able to demonstrate antibody production in rabbits by injecting *Pneumocystis carinii* suspension from diseased lungs into rabbits.

The mortality rate is generally reported as between 15 and 80%. Treatment of interstitial plasma-cell pneumonia is unsatisfactory. Schmöger,[20] assuming that *Pneumocystis carinii* is a protozoon, used primaquine in 36 patients and had eight deaths (22.2%), whereas only five out of 36 chloramphenicol-treated patients died (13.9%). Ahvenainen also favours treatment with chloramphenicol and believes that prevention of superimposed acute pneumonia is most important. Others advise fungicides in combination with broad-spectrum antibiotics.[21] Morphologic changes and even disappearance of *Pneumocystis carinii* from lungs after the use of fungicides has been reported.[21, 22] Leiber[23] postulates the existence of mesenchymal tissue immaturity, especially in premature infants. This is said to make them susceptible to interstitial plasma-cell pneumonia. He uses Cyren B (synthetic œstrogen) to hasten

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maturation and believes that the biological side reactions of high doses of œstrogens (reduction of metabolic rate, reduction of capillary permeability, inhibition of spreading factor) have a beneficial effect on the course of the disease. He lost seven patients out of 12 not treated with œstrogens whereas out of 23 treated with Cyren B only one died. Tobler[24] from Switzerland reported the disappearance of interstitial plasma-cell pneumonia from the premature and newborn nurseries since the introduction of continuous prophylactic ultraviolet radiation in wards for prematures and also for full-term infants under four months. Before this, between 18 and 24 cases were seen each year.

SUMMARY

A case of interstitial plasma-cell pneumonia in a 3-month-old premature, dystrophic infant with brain damage is reported. It is believed that this is the first case clinically recognized in North America. The history, diagnosis, treatment and prophylaxis of the disease are briefly discussed.

ADDENDUM

After completion of this paper, Dr. J. W. Gerrard reported in the May 1958 issue of *Pediatric Clinics of North America* on the incidence of interstitial plasma cell pneumonia in Canada. On reviewing old post-mortem material he found 18 cases, the first occurring in 1930 in Montreal.

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Special Article

A TEACHER'S EYE VIEW OF THE FUTURE OF MEDICINE*

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YOU WILL FIND my text in Ecclesiastes where it says: "Wherefore I perceive that there is nothing better than that a man should rejoice in his works . . . for who shall bring him to see what shall be after him?" But since the writer of Ecclesiastes was a disillusioned old cynic, and since I have always been one who preferred lighting a fire under the pot to merely stirring what's in it, I am going to take my text in an inverted way. There comes a time when a man can no longer rejoice in his works—a time when he must ask himself seriously what shall be after him. Let me therefore try to light a fire – or at least a few hotfoots – under some of the situations that face us as a profession. Let me ask you, as I have asked myself, certain questions about the hazardous and perturbing future towards which we are moving so rapidly.

If the past 150 years show anything, they show that while the tempo of our advance as a race is increasing at a dizzying pace, the advance itself is most uneven. In scientific achievement and technological development we are away out in front of our capacity to safely manipulate our gains; in psychology we have far outstripped our morals, and the pace of this outstripping is so disturbing that we are suffering increasingly serious tensions. It is possible that, if we do not soon increase the speed with which our insight and our morals catch up with the other advances, we may one way or another destroy ourselves. We in the western world – even if we survive the threat of the atom bomb – may become so afraid and so neurotic that we will not only lose faith in our present way of life, but – as the speed of our disillusionment and the Russian economic advance continues – lose faith in our capacity to amend and develop our way of life to meet our needs, and so give in to the tremendous pressure to accept communism or some other absolute, and follow some phoney Fuehrer into some phoney promised land.

I raise this somewhat dismal bogey not because I believe that it is inevitable, but because it constitutes a very real menace unless we decide to live more dangerously and experimentally in the realm of ideas. At present I see no clear sign that we have so decided. In science we have allowed governments through fear to prevent the free exchange of knowledge, in politics we are intensely afraid of novelty, morally we have made little advance since the first century A.D. Our institutions – guided too often by old men and young men who were born old – are amazingly unreceptive to

*The John Stewart Lecture, Dalhousie University, 1958. This lecture has also been published in the *Bulletin of the Nova Scotia Medical Society* (37: 385, 1958).

suggestion and tragically stick-in-the-muddish. Doesn't our own profession as an organized body fall dangerously into this category? We strive above all things to be known as a group that is safe and sane, that has its feet firmly planted on the ground. We doctors by and large dress conservatively, drive conservative cars, live in conservative houses, marry conservative wives, and think conservative thoughts.

Having painted this social background, let me now pose against it certain questions concerning our future as a profession. Naturally, in the short time at my disposal I must limit the number of such questions to those that seem to me the more urgent.

Three disturbing major trends have been moving in on medicine in the last half century: (1) The relative income and relative number of doctors have fallen. There has at the same time been an increase in the scope of insurance schemes which unquestionably foreshadow some form of government intervention. This, in the face of continuing inflation, will result in a further fall in the relative number of doctors and their relative income. (2) Attempts to improve medical education have resulted too often in an increase in the length rather than the quality of the discipline. (3) The tremendous expansion of psychiatry into hitherto unsuspected fields of medicine and sociology is forcing grave problems not only on the psychiatrist but on the rest of the profession, and society in general.

Let us examine these one by one:

1. *Lowered income and socialization.*—The most superficial study of the history of such other groups in the community as our public school teachers makes it plain that, if the relative income of doctors is lowered, and their relative prestige and freedom within society are curtailed, the adventurous, the independent and the resourceful young men will look to less trammeled and more remunerative and prestigious fields. Fewer will undertake the long, hard and expensive discipline of medicine, and these will consist – beside the dedicated few – of an increasingly unadventurous and mediocre lot. Indeed, there is already strong evidence that we are getting less of the cream than we once did. Here is a table recently discussed at a meeting of the Association of American Medical Colleges (Table I):

TABLE I.—UNDERGRADUATE GRADE AVERAGES OF FIRST-YEAR MEDICAL STUDENTS

	% with grade average of		
Year	*A*	*B*	*C*
1950 - 51	40	43	17
1951 - 52	30	55	15
1952 - 53	18	68	14
1953 - 54	21	69	10
1954 - 55	17	69	14
1955 - 56	16	71	14

It shows that those admitted to the study of medicine with Grade A qualifications have dropped in six years to one-third, and those with Grade B, or mediocre, qualifications have doubled. Of 61 students admitted to first-year medicine at Dalhousie last year six were thrown out and four had to repeat their year. These are not reassuring figures.

For some years after the war, Canadian doctors earned the highest professional income. It has already fallen to third place. While this may have been due partly to a hesitancy on our part to raise our fees to meet the effects of inflation, it has perhaps to a greater degree been the result of accepting the rigid fees provided by our various insurance schemes – fees which may have been reasonable in 1945 but which inflation has put seriously out of line with the monetary realities of 1958.

If we continue to accept the fees of these insurance schemes as our standard, can we expect governments – when and if they take us over – to pay more? Governments may be foolish, but not that foolish. Some form of socialization certainly faces us. We have already accepted a form of government hospitalization, and if this is not the head of the camel in the tent I don't know camels. Large groups of the public want socialized medicine. Political parties would not be averse to baiting their platforms with it. By accepting various insurance schemes such as Blue Cross and our own Maritime Medical Care, we have more or less agreed if not to the philosophy at least to the form of socialization.

None of the forms of socialization set up elsewhere – including that in Britain – has attempted, as some trade unions have, to tie fees to the cost-of-living index to defeat inflation. Nor do we seem as a group to be concerned about the dangers of inflation. It would appear clear then that we are going to suffer the same fate as our brothers in Britain who are battling without much success against the grinding effect of the upper millstone of inflation and the lower millstone of socialization. Or like our public school teachers who, as a result of socialization a few generations ago, have become a depressed profession. These are the facts of life and history which we must face. Some of us are already feeling the tightening claws of inflation at our throats. The salaries of the full-time heads of clinical departments which looked so fine a few years ago are now proving so inadequate that recently one of the most outstanding of our Canadian clinical teachers has abandoned his professorate in order to pick up a few chestnuts before the leaves fall.

It is possible, however, that the greatest danger from insurance schemes and socialization is not that these will lower our fees and – this being a materialistic age – our prestige also. The danger lies in the rigidity and standardization that seem inevitably to result from socialization and bureaucratization. Of all those things that menace the future of the freedom-loving and heaven-aspiring spirit of modern man, perhaps the most dangerous is bureaucracy, whose mother was compromise and whose child is conformity. Will Durant has written that civilization, like life, is a perpetual struggle with death. The greatest cause of death in all previous civilizations and nations was that increasing rigidity of thought that strangles those ideological variants by which alone further evolution can take place.

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The proposition I therefore put to you is this: Will we be able to maintain within the rigidity and standardization of further socialization and bureaucratization that freedom and initiative with which to continue into the future the advances we have made in the past? Will we exert the requisite wisdom, courage and co-operation? It won't be easy. Sir Francis Walshe, late president of the Royal Society of Medicine, said recently:

"Thrice within my own professional life has our profession vigorously, even vociferously, stood out for a while against certain Government proposals designed to bring us within a narrower framework and one more subordinated to the State. Yet each time we have fallen back, disunited, disgruntled, defeated and acquiescent."

Has some intimation of their possible future under an increasingly rigid and socialized status already had its effect on the number of students applying to enter medicine? I have already suggested that it may have had some effect on their quality. Here is an excerpt from a fairly recent issue of the Toronto *Globe and Mail*, which I have since seen echoed in some American journals of opinion:

"It is evident by the slump in medical school enrolment that young men are becoming more aware of the struggle and difficulties of medical practice and, with the inherent shadow of a national health scheme ever present, they are definitely looking to other fields."

If, on a continent where the population is increasing at a tremendous rate, not only the relative number but the actual quality of medical graduates is diminishing, you don't have to be an Isaiah to ask: Watchman, what of the night? Our sister profession, nursing, has recently found itself — largely because of lowered relative income and an insufficient modification of the rigidity of its Florence Nightingaleism — with fewer available graduates and a greater demand for them. Their answer to the problem was to introduce another type of nurse—the nursing aide—into their setup. Will we be forced to do likewise?

Perhaps you are asking yourselves: "Why on a lofty occasion like this does our lecturer descend to such mundane talk of income? Man does not live by bread alone." But this is a materialistic age, perhaps the most materialistic man has known. Income has become the magic wand that makes possible most of those freedoms, satisfactions and prestiges without which we seem to be able to feel no complete sense of achievement. I did not create this deplorable materialistic situation: I am merely saying that we should either fight against it or come to the best possible terms with it. We should do this not only to prevent deterioration in ourselves, but — and this should be our ultimate aim — to prevent a consequent deterioration in the service we give the public.

What can we do about it? We can certainly try to offset the deteriorating effects of inflation by tying our fees in some sensible way to the cost-of-living index. We can start giving serious thought to the behaviour necessary to maintain freedom of thought and action under the standardizing effects of further socialization. And we can try to make our medical course more attractive to the really able prospective student, and shape it to produce a better qualified doctor from the steadily deteriorating type of man who now seems to be entering it. Which brings me to the second issue I would like to raise.

2. *Length and quality of medical course.*—The medical course is a long, hard discipline of approximately nine years from high school to earning, and consists, by and large, of four years in arts and science, four years in purely medical studies, and the required intern year. Very few are likely to get through it for less than from $12,000 to $15,000 if they remain single, and college fees and board are going higher every year. In addition to the long lean years there is the rigour of the high standards of scholarship that we expect. Nor is there any indication that medical schools have reached the limit of the number of years they intend appointing to the discipline. Only last year Dalhousie raised its premedical requirements by a year.

But in view of the financial future that seems likely to be our lot, should we not be giving serious thought to shortening rather than lengthening an already grievously long pilgrimage? Come socialization or not, hasn't the time arrived to call a halt to a situation where a man is practically a grandfather before he begins to earn a real income, and can afford to get married before his teeth fall out only if he has rich relatives, or can marry some love-hungry nurse or stenographer who will help pay the rent with her wages?

In examining our curriculum with this thought in mind, it would seem that three major criticisms might be leveled against it: (a) The purely medical part of it is far too comprehensive in the ground it covers, including too much of the fine print and emphasizing too little of the big. (b) It is cluttered pedagogically with too many relics of its mediæval past which consume unnecessary time. (c) There is grave doubt that the sudden divorcement between general and medical education, that occurs on matriculation into medicine, does not militate seriously against the fullest possible cultural development of the student.

(a) Is it not possible that we might actually improve the quality of our product if we eliminated a large amount of the minutiæ that now encumber our course, and instead concentrated on a better teaching of the essentials and fundamentals? It would be interesting to learn—if possible—how much of the matter committed blindly to memory for examination purposes is actually integrated to the student's future needs, or ever after utilized by him because of the rarity of its applicability. Would 30% be an unreasonable figure? I have many times asked myself wonderingly what possible virtue the other 70% could contain to offset the clutter it created in my own mind.

At present it is a most temerarious student who refuses to encompass the whole 100%, because he knows he may be faced with an examination question so recondite that even some of the specialists in the field concerned would be hard

put to answer it correctly. I think it is a fair statement that, on the day the final-year student faces his inquisitors, he knows more facts about medicine than he will ever know again, or than any single one of his examiners knows. Some of the more brilliant students probably know more facts in the actual field in which they are being tested than their examiner. Is this a sensible state of affairs?

If, as medical educators, we grappled with this matter intelligently, couldn't we — with actual benefit to its quality — concentrate on that common body of knowledge that every student should know and is likely to use throughout his working life, and merely indicate to him how to approach those sources of reading and methods of investigation whereby he could deal with the uncommon and the esoteric? Or leave these to be learned as part of a postgraduate effort? In doing so might we not set free from the curriculum a considerable modicum of time?

Furthermore, is it not possible that we might in this way turn out a better-oriented product? The student brain, less strained by the terrific burden of fact, might be more receptive to philosophy and method, those twin energizers that must work on facts to bring them to their highest use? All his life the doctor dealing with patients must be a philosopher using the methods of integration and induction in order to reach those diagnoses that are the basis of therapy. The tendency of the fact-crammed mind is to fit symptoms to memorized facts without the intervention of either integration or induction — a sort of thing that brings the technique of diagnosis perilously close to reading the future from tea leaves.

Yet where is there time for the student to develop a philosophy when all his days are filled with classes and his nights with memorizing? What teacher of clinical medicine has not suffered the frustration of seeing the fact become more important than the patient? On many occasions some of my student groups have failed to turn up to watch the investigation of a difficult obstetrical problem because they had to study for a test the next day. Was that their fault or ours?

(b) That our methods of pedagogy are still cluttered with mediæval relics, the continued widespread use of the systematic, or didactic, lecture attests. This type of lecture, which is in effect a digest of one or more textbooks, buttered with a minimum of personal experience, is droned at the student hour after hour. Entering through his two ears, it travels down his arm and through his pen to the pages of a notebook — very little, if any, remaining between the two ears. There was a time several centuries ago when this had some validity. There were no textbooks. All the information was in the heads of a few men in Salerno, Paris and Oxford. Students had to take notes to carry the torch to the rest of darkest Europe. But today there is no field of medicine that is not covered by several excellent, well-illustrated and dependable textbooks, from which the student can read in 20 minutes what it takes the lecturer an hour to deliver.

And of what value are the notes so laboriously taken? A good many years ago two of my students asked if they could mimeograph for sale didactic lectures which I had foolishly given in my unregenerate past. I agreed, asking only the privilege of first looking them over. I found, to my surprise, on almost every page serious mistakes in fact, and every here and there statements I had never made in my wildest moments. Realizing from this incident the folly of the didactic lecture, and its bastard child the student's notebook, as proper pedagogic tools in a modern world, I promptly gave up all systematic lecturing and from that day onward taught only on a patient. I recommended what I hoped was the best student textbook, and in addition prepared mimeographed notes embodying our practice at Dalhousie. But here is an ironic fact: some of the time I thus set free from the curriculum was promptly snatched for lectures in — of all subjects — medical jurisprudence!

I herewith nominate for oblivion the didactic lecture. With this much mediæval clutter out of the way, I am not sure that, by applying ourselves intelligently to getting rid of other outworn pedagogical techniques, we could not eliminate still more hours, not only from clinical but preclinical instruction. Nor is there any good reason why we could not use this free time to make the medical discipline a fitter instrument for the student's needs and a developer of other of his intellectual processes than memory.

(c) For a long time our present system of teaching the student the arts and sciences for three or four years to develop him as a human being, and then suddenly stopping so developing him in order to turn out a fact-stuffed medical technician, has struck me as highly ridiculous. What are we aiming at in this nine years' discipline — or do we know? As I understand it from listening to various discussions of the matter at faculty and other meetings, two motivations have been at work.

First of all there is the genuine desire to turn out something more than a medical ignoramus — a man who knows too much about medicine and too little about anything else. We would like our graduate to be literate enough to appreciate the odd allusion to the Bible or Shakespeare, and articulate enough to express himself in clear and reasonably grammatic English. At the same time we would like him to combine the supposedly humane and gentlemanly qualities of a doctor of the old school with the scientific methodology of the new. This concept, which is neither clear nor free from a nostalgic sentimentality, probably comes as close to representing what is in our minds, as the bearded and benevolent old gentleman of the coloured Sunday School card does to representing God. Not that this is an ignoble ideal. The trouble is that it is not good enough for our modern needs. If we are to recover that moral grandeur that we have somehow lost in the last 50 years, a moral grandeur integrated to the problems and perplexities of modern medicine and modern society, we surely need to cultivate a more austere and less sentimental ideal.

If any man will look about him at the world today, he must agree that the two qualities most lacking everywhere, from Quemoy to Halifax, are wisdom and moral courage. Is there any calling more in need of these than our own? Shouldn't

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we then heighten our efforts to turn out not merely medical technicians, but at the same time men of wisdom and courage? This being our aim, how can we integrate to our purely medical studies the wisdom of the ages and the courageous example of our ancestors as revealed in history, literature, philosophy and science, in order that they may make the greatest impact and cause the most sparks to fly upward?

Surely not by confining their teaching to those first four most immature years of the student's life, and then neglecting them entirely for the next five. Few things can have a more maturing effect on a man's mind and emotions than that contact with human woes and suffering that comes during the later years of his purely medical studies. Isn't this the time when he should also be exposed to literature, history and philosophy, so that his rapidly maturing mind may feed on a richer diet than mere human pathology? Would not our aim in developing the student as a human being as well as a doctor be better served thus than by the present absurd divorcement of culture from medicine at the time of matriculation from arts and science into medicine? Nor can we refuse the challenge this implies by crying that our business is to teach men to become doctors and nothing else. It was we who insisted on the four years of premedical study. We are stuck with it and we should make the best of it.

We have two serious strikes against us in anything we try to do in this regard. We live on a continent where – at least on the emotional plane – culture is held in some contempt. Even university presidents, orating before business men, have been known to deny their culture as abjectly as Peter did his Lord, performing an intellectual striptease whose main object seemed the revealing of the amount of hair matted on their chests. Haven't we all sinned in this matter? And isn't that why we suffer the disillusionment of hearing our best students speak scornfully of those sciences and premedical humanities on which their clinical studies are based, speak of them as a hurdle to be overcome rather than as a key to life?

The second strike against us is the rigid frame of requirements which, through our qualifying boards, we have clamped on ourselves. Let us suppose that a well-known medical school decides to add a year to its course, or to its premedical requirements. Other schools, jealous of their place in the sun, follow suit blindly. Presently the bandwagon is crowded and then the licensing boards step in to make the extra year a rigid requirement. But once that extra year is added, an implacable yoke has been lowered on our necks that not even Archimedes' lever can lift. Let even the most prestigious school decide to remove one of those added years and, no matter how it may have improved its total course in doing so, its graduates find themselves in jeopardy before licensing boards, and have to walk in the rear of all military processions.

So from Atlantic to Pacific in a hundred medical schools, the student is taught precisely the same subjects in precisely the same way. If the Dean of Medicine at the University of California gets a pain in his right side, the Dean of Dalhousie has to have his appendix out. In a field where we should be experimenting wildly in order to further that evolution which alone will give us continued life, we are caught in this rigid frame of ideology that means certain death. Nevertheless, despite all the difficulties that would beset any effort to change radically our methods of teaching and the length of our course, it would seem that the time is arriving when we must give it some thought. Would the following suggestions light a fire under the pot?

1. Admit to the medical course itself those who have finished two years in the Arts and Sciences.

2. Tear out ruthlessly all our outworn methods of pedagogy and teach the subjects of the medical curriculum in such a way that the student is thoroughly grounded in the basic necessities, but taught a good deal less intensively the unusual and esoteric.

3. Into the many hours thus set free from the purely medical five years introduce the remainder of the humanities equivalent *at least* to an Arts or Science degree, spreading these over *all* the years of the purely medical course, *but not increase the present number of those years.*

This would shorten the entire discipline of medicine from nine to seven years, but is there any reason why the policy of shortening the time required to turn out a better product should be confined to the industrial world? If it is possible, using better modern technological methods, to build a better automobile in a shorter time, is it impossible with better pedagogical methods to turn out a better doctor in a shorter time? Such a scheme as I have outlined – altogether apart from the fact that it would save the student time and money – might have one highly salutary effect. It might drive home to him in a very real way, perhaps even down to the emotional level, the realization that knowledge is one and indivisible, and that for the modern doctor a knowledge of Man is as important as the knowledge of Man's diseases.

3. *The problems and potentialities of psychiatry.* —No one looking at the future of medicine can disregard either the problems or the potentialities of psychiatry. I am not so sure but that psychiatry, more than any other medical specialty, does not offer by far the most exciting vista into our future as a profession. Somatic medicine tends to become more and more a cut-and-dried science and less and less an art. But psychosomatic medicine, since it deals fundamentally with morals, must remain permanently an art. Its methods like those of religion must be based on persuasion—and persuasion will always be an art.

The possibilities facing psychiatry are tremendous, and the decisions that will have to be made concerning it are fraught with the gravest consequences. In the matter of possibilities, may I illustrate from my own specialty those fields within it which psychiatry will probably have to enter before any really great further advances are likely to be made. Here are just a few of those conditions in which our present treatment is highly

ineffective or too surgically slanted, and in which there is some evidence of an emotional cause: spontaneous and habitual abortion, the toxæmias of pregnancy, the various benign uterine bleedings, dysmenorrhœa, sterility, frigidity – and so on.

Already a considerable psychiatric invasion has occurred. These days most obstetricians treat hyperemesis gravidarum psychologically. Natural childbirth – which those of us more afraid of good plain English than gobbledygook are now calling the psychoprophylaxis of labour – is unadulterated psychiatry. It is the psychological conditioning of a woman to face pregnancy and labour in the same way that military training and patriotic propaganda condition the soldier to face death. Hypnotism likewise – which has been waiting around the corner for over a century, and which has neither the dangers nor the disadvantages of any other form of pain relief – is being timidly essayed by some of my brothers. I can see the possibility that it may make our present methods of analgesia, certainly in labour, as anachronistic as the crossbow.

But how is this psychiatric invasion of the non-psychiatric clinical specialties to be handled? Are we simply going to dump these problems into the lap of the already overworked and understaffed departments of psychiatry, in the same way that we turn a sprained back over to the orthopædist? I do not see the biggest dividends in such a method. It seems to me that a wiser and more enlightening way would be for psychiatry to send men into each clinical department to work more or less as missionaries among the heathen. Not only would these missionaries help us to solve our joint problems, but we would learn from them and they would learn from us, and the medical student would learn in a better way than at present from us both. However, the achievement of this much to be desired co-operation will not be easy. We tend to burrow deeper and deeper into the watertight compartments of our individual specialties, and the deeper we burrow the more we lose sight of the bright sky of possibilities above – and the more we tend to stare at our own navels.

(May I add here in parentheses that I believe the time has come when every major clinical department should be staffed in part by men trained in other specialties. Offhand I can say of my own department that it would benefit enormously by the immediate attachment to it of a psychiatrist, an internist, a urologist, an endocrinologist (or physiologist) and a pathologist. And that represents only a beginning. To put it in naval parlance: we have been tending to divide ourselves into groups of destroyers, groups of cruisers, groups of submarines, groups of flat-tops. Isn't what we need a combination of all the essential units in a series of comprehensive clinical task forces?)

But this is perhaps not the gravest problem that besets both us and the psychiatrist. If the future of medicine, as I have hinted, is to lie increasingly in the manipulation of emotions and behaviour, we will soon find ourselves seriously concerned with the problem of morality. I know of no system of philosophy that would exclude from morality the expression of those emotions and behaviours which result in sickness, criminality, or simply an inability to face up to the challenge of life. If hypertension, migraine and gastric ulcers are the expression of improperly controlled emotions and behaviour, in what way do such emotions and behaviour differ from sin?

Could this mean that our profession – at least the psychiatric part of it – has now come the full circle, and that the priest-physician, who was the first physician, must return again? While it may not be fully apparent here, it is a fact in those larger centres that set the pace and fashion of our behaviour that more and more of the most intelligent and useful leaders in business and professional life are turning their back on the church as their confessor and comforter in favour of the psychiatrist. It may be deplorable that they prefer to lie supine on his couch to callousing their knees before their God, but it is a rapidly growing phenomenon which we cannot evade. If it is the wave of the future, we are all going to be splashed by it.

But as I see it – and I am ready to be corrected in this – the psychiatrist has fought desperately against accepting the ancient priestly function. He permits the patient to talk to him in the hope that, by such verbosity, a catharsis may result in the sick one seeing through his emotional haze the heights of Pisgah. But he does not then say categorically to the sick man as the religious teachers have done through the ages: "There is the path to Pisgah – gird up your loins and take it!" He does not even say: "Go and sin no more." In fact, he tends to leave the patient with the idea that he – the patient – is more sinned against than sinning, that the initial transgression lies rather with his parents and with society than with himself, and out of this almost Buddhistic fatalism he must work his salvation. But do we best enhance the quality of our social morality by regarding his transgressions as sicknesses to be excused rather than as sins to be atoned for?

How much longer can the psychiatrist continue in this method? If, in the face of the ever-increasing numbers of those seeking his help to overcome emotional sin, he persists in refusing the priestly role, there is not the slightest doubt that some other species of guide, counsellor and healer will rush into the vacuum being created. Out of this overlapping of worlds all sorts of frictions, rivalries and antagonisms will arise until eventually some sort of unity of effort is arrived at. But if eventually, why not now?

But if the psychiatrist is faced with difficult decisions anent the future of his specialty, so are the rest of us with regard to psychiatry. If what I hear about the place is any indication, our present attitude towards psychiatry is so positively antipathetic and irrational that it can only be the expression of a serious degree of emotional immaturity. Are we internists, pædiatricians, obstetricians – and especially we surgeons – prepared not only to admit the coming invasion of psychiatry into our fields, but to make those changes in our attitudes and practice which must inevitably be required? In the end, of course, we will have to – but it will only be after a struggle in which our consciences will have undergone a hellish battering.

This matter touches very acutely on medical education. If the picture I have just drawn has any validity it must give us concern as to the type of student we admit to the study of medicine. If some similitude of the priest-physician must be revived, should we not search more avidly for the dedicated man, rather than just the career seeker who happens to have the requisite knowledge of reading, 'riting and 'rithmetic. And once we have got him, does it not become absolutely essential that we fill him as full as we can, and in the best way that we can, with the wisdom of the ages? Can we do this by divorcing stupidly, as we now do, the teaching of culture and medicine? Can we do this by setting him no greater example in moral courage than we are now showing in the face of so many of our problems?

Medicine has reached, or is reaching, a sort of zenith. With his entry into the heart, the surgeon has explored the last of the vital organs. With his entry into the soul, the psychiatrist may well, as I have hinted, be on the point of seriously influencing human belief and behaviour. But long before a human system reaches its zenith that rigidity of thought and timidity of experiment which caused the downfall of every empire from Babylon to Britain have fastened their death grip. With our present attitudes, can we escape?

I believe we can. While the trends may be running against us, nothing is inevitable in human destiny. And because, as I said in the beginning, I prefer lighting a fire under the pot to just stirring what's in it – because I agree with Thomas Wolfe that "the essence of faith is the knowledge that all flows, that everything changes"—I make my plea here for a greater flexibility in our thinking, a greater courage in our philosophy, and a greater adaptability in our policies. As someone has wisely said: "There are many roads to Rome, but we shall never find the best so long as every pilgrim is forced to take the same path." In view of the impending future, hasn't the time come for us to throw off our present smugness and lethargy, face the hard facts of our medical tomorrows, and make a really courageous and intelligent effort not only to save what is worthwhile from our not ignoble past, but mix with its stones the mortar of a greater intellectual adventurousness and so build a better medical world than ever was?

SHORT COMMUNICATION

SELF-CONTAINED RESUSCITATION EQUIPMENT*

HENNING RUBEN, M.D.,
Copenhagen, Denmark

IN EARLIER DAYS, resuscitation equipment was used only occasionally and in isolated cases; now it has become a daily necessity in the treatment of injuries sustained in traffic accidents, industrial accidents, etc., and also in the treatment of patients with bulbar poliomyelitis. Resuscitation equipment would also be of vital necessity in cases of mass casualties.

Methods of manual artificial respiration are not always practical or convenient, especially when prolonged treatment is indicated. Furthermore, existing methods do not always provide adequate air exchange.

In order to compensate for the deficiencies of the manual methods, apparatuses for inflation of the lungs have been devised. Since they are used mostly under emergency conditions, these apparatuses must operate only from commonly available power sources and be independent of electricity, compressed air, petrol, etc. Furthermore, they must not be bulky.

Proper elimination of secretion from the airways, apart from postural drainage, must also be taken into consideration in solving this problem.

Obviously, to provide for satisfactory equipment in respiratory emergencies, two different appliances are necessary: one for artificial respiration and another for suction purposes. Both appliances must be independent of installations, light of weight, of small dimensions and fully effective in all circumstances. They should be of the utmost simplicity in order to be used by non-professional personnel, and durable, since they may have to be stored for prolonged periods of time.

The equipment described below seems to fulfil all these requirements.

1. *Apparatus for Artificial Ventilation* (Fig. 1)

The apparatus consists of a "bag-and-mask" commonly used in anæsthesia but *operable without a cylinder.*

Expansion of the bag has been obtained by lining the inside with foam rubber, so as to provide maximum expansion capacity with minimum resistance against compression. When the bag expands, outside air passes into the bag through a non-return valve. The connecting piece between bag and mask contains another non-return valve, which during compression of the bag directs the air through the mask into the lungs of the patient and without resistance lets the expired air out in the ambient atmosphere, thus preventing rebreathing into the bag.

Tests have shown that the capacity of the bag is more than 40 litres of air per minute. A single, ordinary compression of the bag will expel up to 1300 c.c. of air, the amount depending on the way in which the bag is compressed. The capacity of the bag is sufficient to provide hyperventilation if required. By inserting a rubber tube four or five feet long between the mask and the bag, the resuscitator may be operated by foot, thus allowing the operator to use both hands to keep the mask

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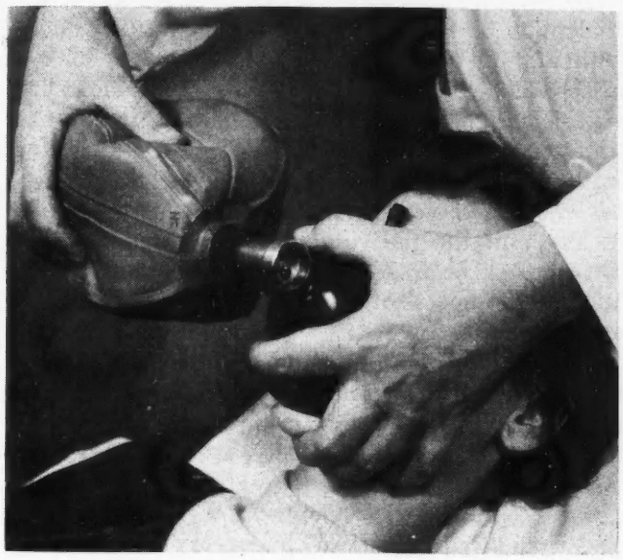

Fig. 1.—Bag respirator in use. Note that no cylinder is used to feed gas in the bag.

airtight and the patient's jaw forward. It was once thought that inexperienced personnel required both hands for proper application of the face mask; however, in the course of training hundreds of laymen in operating the apparatus it has been found that they easily learn to handle the mask correctly with only one hand. The connecting piece may also be attached to an endotracheal tube or a tracheotomy tube.

On occasion the resuscitator has been in continuous use for more than eight hours without causing undue fatigue in the operator.

Furthermore the resuscitator has been used satisfactorily during anæsthesia for the ventilation of patients, some of whom had an open chest. In emergency circumstances and even under extremely primitive conditions, anæsthesia can, therefore, be given safely when this very simple equipment is available.

Fig. 2.—Use of the suction apparatus, which is independent of all installations and gas cylinders, being activated by foot.

2. *Suction Apparatus* (Fig. 2)

The apparatus consists of a concertina bag and a trap bottle with tubing. Suction is obtained by intermittently compressing the bag with the foot. Strong springs cause the bag to expand. The necessary directional valves in the apparatus are made of resistant material which should withstand the action of humidity, water or acid solutions (gastric contents). The size of the valves is such that secretions and blood may pass through them should the trap bottle overflow. The bellows system provides continuous suction even in case of overfilling.

The suction pump can be cleaned without dismantling; it is small and light.

CONCLUSION AND SUMMARY

Two appliances devised for the treatment of apnœa and removal of secretions from the airways are described.

One is a *resuscitator* adapted from the "bag-and-mask" principle used in anæsthesia, but made independent of cylinders, because the bag is self-inflating.

In actual use, it has provided artificial respiration for more than eight hours at a time. It can be used for ventilation during anæsthesia (including open chest surgery).

A *suction apparatus,* independent of usual power sources, completes this field resuscitation set. Suction power is produced by the expansion of a concertina bag which is compressed by foot. In its design, efforts have been made to provide a suction apparatus which can function even under most extreme conditions with a minimum of maintenance. The concertina bellows weigh approximately one pound, and the weight of the complete pump, including bottle and mountings, is less than five pounds.

The two apparatuses form an independent set which, in any emergency, provides fully satisfactory treatment of patients in respiratory distress.

The apparatuses described were obtained from British Oxygen Canada Ltd., Toronto.

BRACELET IDENTIFIES MEDICAL CONDITION

Doctors who want to insure proper emergency medical care for epileptics, diabetics and people who react adversely to drugs can prescribe a bracelet that warns attendants of the patient's special condition. The bracelet, which was invented by Dr. Marion C. Collins of Turlock, California, has a silver or stainless steel tag emblazoned with a red staff of Æsculapius on one side and an appropriate medical warning on the other. In addition to inventing the bracelet, Dr. Collins has founded the Medic Alert Foundation to manufacture it. Bracelets are available on a membership basis of $10 which includes a permanent record of the patient's serial number, name and address on file at the Foundation. Additional bracelets under a family membership are $5. (Medic Alert Foundation, Turlock, California.)

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ATOMIC ENERGY AND MENTAL HEALTH

Probably the vast majority of persons would admit to a certain anxiety about the implications of the harnessing of atomic energy even for peaceful purposes. To many, the bright hopes which should be aroused by this new form of control over nature are greatly overshadowed by worries over the possible risks, not only to this generation but also to generations to come. One wonders whether the level of anxiety so produced is greater than has been evident in human society in earlier periods of technological change. Did the Industrial Revolution arouse as much emotional disturbance in the educated 19th century man as this new revolution has aroused in our generation? Is all this anxiety inseparable from the new adventure, or has it been promoted by those who should know better — the scientists, the authorities and the press?

A valuable document has recently been published by the World Health Organization[1] reporting the findings of an interdisciplinary study group, which considered the mental health aspects of the peaceful uses of atomic energy. In general their report falls into three parts. They began by considering the evidence that atomic energy is a source of widespread anxiety, they analyzed the causes for this, and they made suggestions for dealing with this situation. As might be expected in this pioneering endeavour, they had no ready-made formulæ for allaying the fears of mankind, but they did honestly and without bias lay bare our ignorance in this field.

Factors make this by far the most alarming and stress-inducing change which human society and the individual have yet had to face. For one thing, it is very difficult for many persons to separate in their minds the productive and peaceful uses of atomic energy from its destructive possibilities. Secondly, atomic energy represents a form of magic. An enormous force emanates from an extremely small quantity of matter, and cannot be apprehended by any of the senses — a situation analogous to that in childhood phantasies. Faced with atomic power, say the study group, man is in a situation like that of the very young child first experiencing the world. Like a child, a man in this situation feels guilty about his presumption and expects punishment for it. Moreover, the change has happened very quickly, and it may be that society and the individual can only adapt themselves to widespread changes in the human situation if the speed of change falls below a certain level.

The study group points out also that the changes have occurred at a time when the basic securities of the individual have been strongly challenged—by the secularization of society, and by the general disillusionment with the rosy dreams of human progress which the scientists of the late 19th century and the early 20th century conjured up so readily. Because the scientists have come themselves to doubt in the infallibility of their dicta, the public has also shared their doubt. The public is of course only too aware also of the vacillations and disagreements among scientists, particularly when the latter are incautious enough to step out of the safe area of facts and venture into the area of opinions.

It is true that in many countries and at many levels of society there is a feeling that there are no mental health or even morale aspects of atomic energy, but the study group wisely point out that this attitude is very likely a reflection of the general distaste for considering psychiatric problems. The general fears about radiation, perhaps associated with the fact that it has been used extensively to treat particularly fearful diseases such as cancer, have recently led to the irrational attitude of the public towards perfectly legitimate radiodiagnostic measures. Some patients undergoing radiotherapy do show a number of psychological and psychosomatic symptoms, but these are probably not related to any physiological effects of the radiation, although this is a subject which remains the prey of uncontrolled clinical impressions, in the absence of research.

The study group, after reviewing the variety of reactions in the public to atomic energy, sums up the situation as follows: "In short, whether the result be general anxiety, specific fear, denial, humour, confusion, blockage of thought, or a balanced unrational grasp of the situation, the subject of atomic energy never fails to make people react."

In making practical suggestions for alleviating the mental distress engendered by the coming of the atomic age, the group point out that these fall into three categories: (1) remedial measures designed to alleviate a harmful situation; (2) educational measures, both short-term and long-term; and (3) research measures. Thus, the most important tasks in the social and economic field are epidemiological; there is a pressing need for more knowledge of the phenomenon of social disorgan-

ization and its prevention. Research must be directed towards factors making for security and strength within the cultural pattern: this research should tell us something about tolerance of change within a society.

From the educational viewpoint, the group deprecates any attempt to solve the problems by propaganda, which will certainly be met with distrust. The serious difficulties which beset communications between the scientists and the non-scientific authorities must be overcome – the scientists must be humanized, and the humanist must be led to an understanding of scientific concepts. The group also suggests that education is best undertaken in small communities by people known to the community concerned. Small but highly qualified local teams should be formed, consisting of perhaps a psychiatrist, a psychologist, a sociologist and a journalist. They should study local conditions and investigate local mental health problems in connection with atomic energy, and take the necessary action arising from their investigation.

The report concludes with the statement that the greatest hope "is the raising of a new generation which has learned to live on terms with ignorance and uncertainty, and which in the words of Joseph Addison 'rides in the whirlwind and directs the storm' ".

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Editorial Comments

THE EFFECT OF ACETYLSALICYLIC ACID (ASPIRIN) ON THE GASTRIC MUCOSA

Although this writer has no figures for the total annual world-wide consumption of acetylsalicylic acid (aspirin) or aspirin containing preparations, it must surely assume staggering proportions. It is a cheap, effective and, by and large, innocuous chemical, and has in recent years been given a considerable boost by investigations which demonstrated its value in rheumatic fever and in the rheumatoid diseases.

That even this mild drug can cause occasionally severe allergic reactions is, of course, well known. Less well known are the effects of aspirin on the stomach. The popular belief that aspirin can affect the heart probably originated in the fact that aspirin not infrequently causes heartburn and upper abdominal and precordial discomfort. Schneider[1] in his report of an investigation of the effect of aspirin and of a buffered aspirin found that 6 out of 10 subjects given aspirin showed gross blood in every specimen of gastric juice obtained afterwards. When buffered with magnesium oxide it did not cause any gross bleeding, but on the other hand there was a significant rise in gastric acidity in nine subjects. Placebos failed to produce either bleeding or a rise in acidity. Schneider and subsequent writers who quote Douthwaite in 1938 reported melæna and observed mucosal changes through the gastroscope after aspirin ingestion. On the other hand, Wolf and Wolff[2] were unable to observe any changes in their patient Tom when crushed aspirin was applied to the gastric mucosa. Isolated reports of hæmorrhage or melæna after ingestion of aspirin have been appearing throughout the years, and Lange[3, 4] reviews the subject in the introduction to his own investigations into the relationship between aspirin and gastric hæmorrhage. Lange found that even the most soluble and most easily dispersed preparation of aspirin, if taken daily for 17-23 days, caused a marked increase in the number of positive benzidine reactions in the stools of the patients. Enteric-coated tablets caused fewer positive reactions, and if the tablets were taken after meals there was also a significant decrease in the number of positive benzidine reactions. His investigation of patients admitted to hospital for hæmatemesis and stroke or melæna led him to the conclusion that salicylates are a significant factor in causing gastric hæmorrhage, particularly in elderly patients who have been taking the drug for long periods.

In a much larger series of patients Stubbé of Leyden[5] confirmed Lange's finding that administration of aspirin caused the appearance of occult blood in the stools in some 68% of cases. He was able to reproduce the phenomenon in 27 out of 28 cases and found that after administration of enteric-coated aspirin the benzidine reaction reverted to negative. Spectroscopic and spectrophotometric examinations confirmed that the positive benzidine reaction was indeed due to blood. Alvarez and Summerskill[6] refer to previous observations in the literature in which recent intake of salicylates was noted in a fairly high proportion of patients admitted for massive gastric hæmorrhage—a third in one series, and 19 out of 46 in another. In their own study of 103 patients admitted to the Central Middlesex Hospital for massive hæmorrhage thought to be due to acute or chronic peptic ulceration, 55 had taken salicylates in the 24 hours before the onset of hæmorrhage. Of particular significance is the fact that in 35% of those who had taken aspirin before the hæmorrhage no demonstrable lesion was found and that in another 14% there was an acute gastric ulcer. In the group who had not taken any salicylate before hæmorrhage only 11% had no demonstrable lesions and 19% had acute ulcers. Occult blood loss was found in some 50% of patients with peptic ulcer or with dyspepsia without x-ray evidence of disease, and of controls during periods of aspirin consumption. The frequency of occult bleeding was equal in all three groups after ingestion of both soluble and insoluble salicylates. The same writers present in a further paper[7] two cases of severe iron deficiency anæmia due to occult bleeding associated with the taking of salicylates. In both cases, repeated investigations failed to reveal the cause of the profound anæmia for several years and led in the second case to an unnecessary hysterectomy. Salicylate administration in hospital was followed by occult bleeding and the anæmia was finally controlled in both patients after withdrawal of salicylates.

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The lesions caused by salicylates may be acute erosions in the stomach or possibly in the small bowel, although one must assume in some cases that we are dealing with reactivation of a chronic peptic ulcer. It will be well to bear in mind that occult bleeding may be due to intake of salicylates, and that one should specifically question patients with unexplained anæmia regarding their intake of analgesics; if the possibility of frequent or prolonged salicylate administration exists, one should perform tests for occult blood after controlled administration of the drug for 5 to 10 days. Since peptic ulceration is common in the general population and the use of salicylates, particularly aspirin, is well-nigh universal, these findings are of considerable importance. W.G.

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WHAT IS INTERNAL MEDICINE?

Unless the experience of this writer is unique, every internist has at some time or other been plagued by the question from patients and acquaintances alike: what is internal medicine? Although this specialty has been in existence for many years, there is still no satisfactory definition for it, and most writers, when faced with the task of giving an answer to this question, circumvent it by citing the tasks which an internist can be expected to perform, or by pointing to the things which are outside his field.

In discussing his own difficulties in defining internal medicine, Paul S. Rhoads in an editorial (*A.M.A. Arch. Int. Med.*, 102: 515, 1958) mentions the descriptions in several dictionaries: these are obviously unsatisfactory, besides contradicting each other. To judge by the various unsuccessful attempts by outstanding internists to define their own specialty, it appears likely that internal medicine eludes definition. To O. H. P. Pepper and Osler, mentioned by Rhoads, one could add many more who have tried and failed to give a generally acceptable brief definition, nor does the perusal of textbooks of internal medicine solve the problem either. Some of them describe more or less clinical extensions of physiology and pathology, whilst others include psychiatry and dermatology and some even gynæcology.

Rhoads points to this difficulty, which is of some importance as regards the training of future internists. What should the minimum requirements be? Who is to decide this? The specialty board of internal medicine in the United States rightly emphasizes that more attention should be given to logical thinking than to correct answers in evaluating examination papers. Rhodes questions the feasibility of this desirable and laudable approach, and introduces a number of other recommendations which may also be somewhat difficult of realization. Medical education is under fire and under review in many lands, just as is education in general.

We learn from an editorial in the *Lancet* (2: 733, 1958) that the newly formed Association for the Study of Medical Education (ASME) recently held its first conference in London, England. The examination system was attacked as a stifler of thought and it was emphasized that there is need to teach the student how to think and to make him realize that intellectual pursuits are enjoyable for their own sake. "These qualities, once generated, can enable the student to go on learning for the rest of his life."

To return, however, to the initial object of our inquiry—the specialty of internal medicine. We believe that the label of "glorified general practitioner," used by some in jest, can be applied to a large number of practising internists. This label should not be considered derogatory but taken as a compliment, for it implies that the internist acts as a family physician, bringing his advanced training to bear on the patient's health problems from a broad basis rather than from a narrow specialist approach. W.G.

THE AMA NEWS

The emergence of "THE AMA NEWS", The Newspaper of American Medicine, is worthy of contemporary comment. Published every other Monday by the American Medical Association, *The News* utilizes all the techniques of the modern tabloid and constitutes a breezy commentary on matters which touch on the interests of the American doctor.

Designed to acquaint the medical reader with condensed versions of matters which he may not read in the Organization Section of his own Journal, the new publication is likely to achieve its purpose of spreading a veneer of information over a wide area. The style of the paper is naturally journalistic and the material is handled with slick professional skill. It is possible that strict accuracy may be difficult to maintain and the AMA has found it necessary to publish the following disclaimer: "The Association does not necessarily endorse all of the material appearing in *The News*." The reactions of readers to the new publication, as expressed in letters to the Editor, have varied from unqualified approval to critical comments which cite misrepresentation of fact and which indicate distress at this "disgraceful sheet".

Viewed from this side of the undefended border, this innovation in medical publishing is worthy of close attention since it is obviously aimed at improving internal public relations. This is a matter of concern to all large organizations, and the effort of the AMA to achieve better understanding of Association policy by the membership is an interesting development. Whether this method will achieve the purpose remains to be demonstrated, and in the process we may all learn valuable lessons.

Medical News in brief

TREATMENT OF INTRACTABLE PAIN BY SUBARACHNOID INJECTION OF CARBOLIC ACID

If carbolic acid is dissolved in Myodil (Pantopaque: ethyl iodophenyl undecylate) or in glycerin, it is not destructive to the tissues and is absorbed very slowly. For treatment of intractable pain, Brown (*Lancet*, 2: 975, 1958) used mostly carbolic acid dissolved in Myodil and injected 2 ml. into the lumbar and sacral region and up to 3.5 ml. into the thoracic and cervical regions. In the latter two regions the injected fluid was "positioned" with the help of fluoroscopy. Of 38 patients with malignant disease, 30 obtained satisfactory relief of their hitherto intractable pain. In the group without malignant disease, the results were much less satisfactory but in some partial relief was obtained. Carbolic acid solutions are believed to act on the sensory nerve root at or proximal to the ganglion by causing permanent destruction of part of the root, with resulting selective block of pain perception from somatic disease. The patient can still feel the pain of pinprick, acute inflammation or other external stimulus. There has so far been no evidence of adhesive or obliterative arachnoiditis, and the author believes that this treatment is entirely safe when used according to his method. As late results cannot be definitely ruled out, it is recommended that this treatment be restricted to the severe pain of malignant disease.

MEPROBAMATE ADDICTION

Meprobamate has been used extensively now for three and a half years. There is no doubt of its efficacy as a muscle relaxant and mild sedative, and its wide acceptance has been partly due to its apparent freedom from toxic side effects and addiction. However, Mohr and Mead (*New England J. Med.*, 259: 865, 1958) point out that it is only harmless in comparison with other so-called tranquillizers and that there is now evidence to show that it may produce addiction. They describe the case of a male alcoholic who had been treated with barbiturates and become addicted to these. Later, when he had become abstinent from both these drugs, he was given meprobamate daily for nervousness due to overwork. He became concerned with the amount of drug he was consuming and enquired as to the possibility of addiction, but was reassured. However, a few months later it became apparent that he was addicted, and tremors and anxiety resulted when withdrawal was attempted.

On admission to hospital he was consuming regularly fifty 400-mg. tablets of meprobamate every 24 hours. On admission he was confused, anxious and ataxic. Withdrawal of his drug produced a typical and severe grand mal seizure and his medication had to be temporarily started again. The authors suggest that meprobamate should be prescribed with extra caution to any patient with a history of alcoholism or other addiction. When addiction to meprobamate is suspected, gradual and controlled withdrawal is probably the treatment of choice.

TEST FOR CŒLIAC DISEASE

It has been established that the injurious factor in the diet of children with cœliac disease is in the gliadin fraction of wheat flour. Hence a gliadin tolerance test might seem to be helpful in diagnosis of this disease. Payne and Jenkinson of the Hospital for Sick Children, London, England (*Arch. Dis. Childhood*, 33: 413, 1958) describe such a gliadin tolerance test in 33 cases of cœliac disease. They gave a dose of gliadin (350 mg./kg. body weight) in water to the patient and sampled the blood hourly for five consecutive hours, subsequently estimating the plasma glutamine in each sample as glutamic acid. They show that the increase in apparent plasma glutamine after the first dose is significantly greater in children with coeliac disease than in control children convalescent from diseases with no gastrointestinal involvement. A small group of children convalescent from gastrointestinal dysfunction due to causes other than cœliac disease showed an increase intermediate between that of normal controls and cœliac children. There was no quantitative relationship between increase in plasma glutamine and the phase of the disease. The overlap of range of results from controls and cœliac patients was considerable, and the authors therefore do not recommend the test as a diagnostic one.

SOLAR LIPSTICK

Scientists from Queensland, Australia, note that sun exposure in their state is a major problem, causing many skin lesions in those following outdoor occupations. Each year the Queensland Radium Institute treats more than 200 cases of carcinoma of the lip, quite apart from pre-malignant changes. For use in cases where patients already had lip scarring or atrophy and were exposed considerably to the sun, a colourless lipstick was devised containing 5% salol, which acts as a specific filter for the troublesome wave-lengths of sunlight. Mowatt and Robertson (*M. J. Australia*, 2: 222, 1958) claim that use of these lipsticks in over 1000 cases has made a tremendous improvement in the condition of the patients' lips. The lipsticks are suitable for patients exposed to excessive sunshine and also for patients who have had treatment of the lip by radiotherapy or cautery and therefore have poor tolerance of the mucosa.

COMBINED HEPATIC AND PORTAL DECOMPRESSION FOR ASCITES

A middle-aged heavy drinker had cirrhosis of the liver and extreme ascites, which refused to yield to medical measures. McDermott (*New England J. Med.*, 259: 897, 1958) therefore attempted a double hepatic and portal decompression by performing a double end-to-side portacaval shunt. Results one year later have been entirely satisfactory; ascites has completely disappeared and the metabolic pattern of hyperaldosteronism has been reversed. An addendum to the article mentions that five other patients with a similar condition have been treated by combined portal and hepatic decompression with excellent clinical results so far.

(Continued on advertising page 48)

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MEDICAL FILMS

CONTINUING the listing of available films on medical and related subjects, we list below additional films. The films are held in the National Medical and Biological Film Library and are distributed by the Canadian Film Institute, 142 Sparks Street, Ottawa, Ontario. The evaluations have been prepared by Canadian specialists in the subjects of the films, under the Medical Committee of the Scientific Division of the Canadian Film Institute, which is headed by Dr. G. H. Ettinger.

PHYSIOLOGY

The Cerebral Cortex of the Monkey – 1949; Sound; Colour; 23 minutes.

Produced by the I.C.I. Film Unit, for Imperial Chemical Industries Ltd. Technical Advisers: University Laboratory of Physiology, Oxford, England.

Description.—This instructional film presents a physiological demonstration of the fundamental functions of the motor cortex of the monkey.

Appraisal (1950).—Highly recommended as an excellent teaching aid for medical students in the pre-clinical years; suitable for all other interested medical audiences, graduate and undergraduate. Film achieves a nice blend of history, operative procedures and actual experimental results. Photography is excellent and important points are clear and not obscured by excess detail. *Unsuitable for non-medical audiences.*

Availability. – National Medical and Biological Film Library ($3.00). For purchase apply to Publicity Department, Imperial Chemical (Pharmaceuticals) Limited, Fulshaw Hall, Wilmslow, Manchester, England.

Control of Body Temperature—1940; Sound; B & W; 11 minutes.

Produced by Erpi Classroom Films (now Encyclopædia Britannica Films Inc.). Technical Advisers: Dr. A. J. Carlson *et al.*, University of Chicago.

Description. – An instructional film designed to demonstrate the mechanisms regulating the temperature of the human body.

Appraisal (1945).—The phenomena described are well established and the treatment of the subject is good. Film should prove a useful adjunct to teaching in high schools, colleges and schools of nursing. While a certain amount of previous knowledge is necessary if the film is to be followed intelligently, any group interested in the subject should derive benefit from it.

Availability. – National Medical and Biological Film Library ($1.00). Purchase (in Canada) from General Films Limited, 1534—13th Avenue, Regina, Sask.

The Control of Voluntary Muscles—Some Principles of Kinesiology—1943; Silent; Colour; 25 minutes.

Produced by the Visual Medical Education Department, Northwestern University Medical School. Authors: Frederic T. Jung, Ph.D., M.D., Department of Physiology, and William H. Lazear, D.D.S.

Description. – An instructional film, demonstrating the action of certain voluntary muscles of the human body.

Appraisal (1947).—Definitely possesses value as an aid to teaching muscle anatomy and physiology and is excellent for physical-training instructors, occupational therapists and physiotherapists. For doctors, medical students and nurses, while entertaining and interesting, it would not have the same value.

Availability. – National Medical and Biological Film Library ($4.00). Purchase from Visual Medical Education Department, Northwestern University, Chicago, Illinois.

Cystometrography—1940; Silent; Colour; 55 minutes.

Produced by A. I. Willinsky, F.R.C.S.[C.], Urologist-in-Chief, Toronto Western Hospital.

Description.—This record film, presented in its original copy to the National Medical and Biological Film Library by the author, abstracts clinical cystometrography (measurements of human urinary bladder pressures) in health and disease.

Appraisal (1946).—This is a most difficult subject to present via the film medium, and the film tends to be tedious. Techniques and theories are constantly changing and the film has value only for the specialist in urology. *Unsuitable for non-medical audiences.*

Availability. – National Medical and Biological Film Library ($5.00). Not available for purchase.

Digestion—Part One—1949; Sound; Colour; 17 minutes.

Produced by Gaumont-British Instructional Limited. Supervised by Professor Winifred Cullis, C.B.E. Written and directed by Beryl Denman Lacey, B.A.

Description.—This instructional film shows, by means of animated diagrams, the muscular and mechanical aspects of the human digestive process.

Appraisal (1952).—A beautifully prepared and arranged film of a rather elementary character, apparently designed for high-school and college biology classes. It overlaps Part Two of the film too much, however, and it would usually be better to show Part Two alone. The animation is excellent and the film is recommended for pre-medical students, nurses, medical technicians and auxiliaries, and high-school and college students. Suitable for any other interested audience.

Availability. – National Medical and Biological Film Library ($3.00). Purchase from J. Arthur Rank Film Distributors (Canada) Limited, 277 Victoria Street, Toronto, Ontario.

Digestion: Part Two—1950; Sound; Colour; 20 minutes.

Produced by Gaumont-British Instructional Limited. Supervised by Professor Winifred Cullis, C.B.E. Written and directed by Beryl Denman Lacey, B.A.

Description.—This instructional film demonstrates, by means of animated diagrams and symbols, the chief changes involved in the chemical breakdown of carbohydrates, proteins and fats within the alimentary canal.

Appraisal (1952.)—A beautifully prepared and arranged film. The animations are excellent and convincing, and the spoken word well enunciated and clear. It seems to be designed for high-school and college biology classes but it is also highly recommended for medical students in the early years. Reviews some of the material on mechanical aspects of the digestive process contained in Part One and is considered the better and more complete film; for medical students at least it would be shown alone in preference to Part One. Recommended as above and for nurses and medical technicians and auxiliaries; suitable for any other interested audience.

Availability. – National Medical and Biological Film Library ($3.00). Purchase from J. Arthur Rank Film Distributors (Canada) Limited, 277 Victoria Street, Toronto, Ontario.

Digestion of Foods—1938; Sound; B & W; 10 minutes.

Produced by Erpi Classroom Films (now Encyclopædia Britannica Films Inc.). Technical Advisers: Dr. A. J. Carlson and Dr. H. G. Swann, University of Chicago.

Description. – An instructional film, demonstrating the secretion of digestive juices, the digestion of foodstuffs and their absorption. Deals with both the chemical and the mechanical aspects of digestion.

Appraisal (1945).—Subject matter is simply and clearly shown and, while some knowledge of chemical and biological language and methods is needed if it is to be easily followed, the film should be a valuable teaching aid in high schools, colleges, schools of nursing and for any interested scientific audience. Only well-established phenomena are presented.

Availability. – National Medical and Biological Film Library ($1.00). Purchase (in Canada) from General Films Limited, 1534—13th Avenue, Regina, Sask.

(To be continued)

REVIEW ARTICLE

THE APPLICATION OF THE HUMAN BLOOD GROUPS TO BLOOD TRANSFUSION*

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Toronto

THE RAPID INCREASE in our knowledge of the human blood groups, which was precipitated by the discovery of the first Rh blood group in 1940, has been maintained not only by the development of new techniques for the detection of antibody and an increasing awareness of the situations in which antibody may be found, but also by a clearer understanding of the genetical possibilities to be considered and frequent use of statistical methods. Although the last of the nine principal blood group systems was discovered in 1951, many new facets have come to light in the last seven years, new alleles have been integrated with the established systems, and there has been a growing appreciation of the genetic convenience of the human blood groups which has led to their increasing use in the fields of human genetics and anthropology.

TABLE I.

Principal systems	*Year of discovery*	*New developments in these systems since 1950*
ABO	1900	A_4, A_0, "Bombay" type, 1951/55; B_w, 1956; A_m, 1956; B_x, 1958.
MNSs	1927, 1947	s, 1951; U, 1954; V^w, Mi^a, 1954, 1957.
P	1927	"Jay System" integrated, 1955.
Rh	1940	D - -, 1950; E^u, 1950; C^u, 1951, C^x, 1954; E^w, 1955; f, 1953; V, 1955.
Lutheran	1946	Lu^b, 1956.
Kell	1946	Kp^a, Kp^b, 1956; K–k–Kp(a–b–), 1958.
Lewis	1946	Le(a+b+), 1956.
Duffy	1950	Fy^b, 1951; Fy(a–b–), 1955.
Kidd	1951	Jk^a, 1951; Jk^b, 1953.

Table I shows the principal systems and some of the newer findings concerning them; no attempt has been made to describe the many "low incidence" blood groups now known.

After the discovery of the ABO system by Carl Landsteiner in 1900, he and his pupils Levine[1, 2] and Wiener[3] produced, by deliberate immunization experiments, the animal antisera that first detected the MN and P antigens and the beginning of what was to become the Rh system. From that time onwards, all the blood groups have been discovered; the starting point has been an antiserum of human origin, in most instances the serum of a mother taken just before or just after delivery, which reacted with cells irrespective of their known antigen content. Most of the recent additions shown in Table I have been to the "older" systems, possibly because there has been more time to study and to try to understand their genetical background; certainly, as far as the ABO system is concerned, there are more unanswered questions than in any other system.[4]

The known blood group antigens give rise to over three million phenotype combinations. The insult of incompatibility, whether from previous transfusions or pregnancies, has resulted so far in a total of some 40 different types of antibody. There are, therefore, many possible problems to confront the serologist. That they are reasonably rare is due to three factors: the frequency distribution of the various antigens, their relative effectiveness, and the diverse antagonism of individuals to their presence. We may now consider these factors by examining the blood group systems in turn.

ABO SYSTEM

The main problems that are likely to be encountered concern the antigen A and anti-A. Everyone is familiar with the fact that, on rare occasions, persons of group A_2 or A_2B possess anti-A_1 which reacts with the antigen A_1, and that persons of group A_1 or A_1B may occasionally possess what is at present called anti-H, which reacts most strongly with group O, A_2, and A_2B cells. Either of these extra-agglutinins may be encountered in compatibility tests performed at 20° C., or they may be present when ABO grouping a donor or recipient.

There are also rare alleles of A called A_3, of which we have recently seen one example, and A_x[4] which is a collective term for a number of phenotypes such as A_4 and A_0. A_3 cells usually group as A; the agglutination pattern with anti-A is characteristic – many small agglutinates in a sea of free cells rather like the "mixed field" of donor and recipient cells seen after transfusion. A_x cells, however, usually group as group O because of the weak or negligible reaction with anti-A. Anti-A+B serum from group O persons is a useful reagent for detecting such alleles and for checking group discrepancies; such antisera are, in fact, used routinely in blood grouping by many British transfusion centres. Even rarer ABO phenotypes exist: A_m[5] and the "Bombay"[6] phenotypes are the first examples of modifying genes at work; B_w[7] and B_x[8] are weak alleles at the B locus.

Much has been written about the "dangerous" group O donor, but group O, *per se*, is dangerous only when transfused to recipients of other ABO groups, and it is a fundamental tenet of blood

*Presented at the 22nd Annual Convention of the Canadian Society of Laboratory Technologists, Toronto, June 1958.

†From the National Reference Laboratory, Canadian Red Cross Blood Transfusion Service, Toronto.

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banking that blood of homologous group be transfused whenever possible. In many normal group O persons there is an "incomplete" or "immune" form of anti-A or anti-B, with or without hæmolytic properties; depending upon the technique used, the proportion of people with incomplete anti-A or anti-B varies from about 20 to over 50%. There is as yet no entirely satisfactory single test to detect these incomplete or hæmolytic agglutinins. At present, we use a simple test of hæmolytic activity,[9] employing a 3% suspension of group A_1B cells, which, although we do not add supplementary complement as recommended by Chaplin,[10] nevertheless appears in practice to confirm the results of Gardner and Tovey[11] and to exclude donors possessing anti-A or anti-B hæmolysins as well as the great majority of donors with a significant titre of incomplete or saline agglutinins. With this method 34% of a sample of 59,852 group O donors tested by four different centres were rejected.

RH SYSTEM

Next to the ABO system, the Rh blood groups are the most important, for they are not only a too frequent cause of hæmolytic transfusion reactions but are also the principal cause of hæmolytic disease of the newborn.

TABLE II.

Allelomorphic genes	*Known antibodies*
D, D^u, or (d)	Anti-D
C, C^u, C^w, C^x, or c,c^v	Anti-C, C^w, C^x, or e
E, E^u, E^w, or e	Anti-E, E^w, or e
(F) or f	Anti-f

Table II shows the known allelomorphs at the Rh loci on the chromosome; d and F are in parentheses because, although these genes have been postulated, demonstration of the corresponding antigen awaits the discovery of the antibodies. D^u, C^u, and E^u have this in common: they give some, but not all, of the reactions expected of D, C, and E respectively.

It is routine practice to Rh-type recipients only with anti-D, but donors who appear to be D-negative are also tested with anti-C and anti-E. Rh-negative bottles of blood must not contain the antigens D, C, or E, and to that definition I would add that neither should their plasma contain anti-Rh. The reason for the extra tests on D-negative donors is simple: first, the antigens C and E, although weaker than D, may provoke antibody formation in susceptible persons; secondly, and more important, as is shown in Table III, a substantial proportion of people with the phenotypes Cde/ and cdE/ possess the antigen D^u, and D^u can cause the formation of anti-D in D-negative recipients.

D^u may be of a hereditary variety, or there may be a normal D gene whose expression is diminished by the presence on the opposite chromosome of C without D or E [12]. D^u cells do not often react with saline anti-D, but they are frequently agglutinated by slide-test anti-D sera, particularly if they are of the so-called "high-grade" variety. The only safe way to detect D^u is to see whether one or more incomplete anti-D sera will sensitize a saline suspension of the cells to an anti-globulin serum; if the result is positive, and if a direct Coombs test on the cells is negative, D^u may be presumed to be present. Although several examples of D^u persons forming anti-D have been reported, Levine[13] points out that the chance of a D^u person's forming anti-c if transfused with Rh-negative blood is infinitely greater, and recommends that all recipients known to be D^u-positive should be transfused with Rh-positive blood of the same Rh phenotype.

The fact that both donor and recipient are Rh-positive is no guarantee that they are compatible for Rh antigens other than D. About 75% of Rh-positive people are, in fact, homozygous for either the antigen C or e, and are therefore candidates for the production of anti-c or anti-E. Considering that the great majority of transfusions are from Rh-positive donor to Rh-positive recipient, this

TABLE III.

Reactions with saline-active antisera			*Possible phenotypes*	*Number of donors tested*	*Percentage possessing D^u*
Anti-D	*Anti-C+D*	*Anti-E*			
0	+	0	Cde/cde, Cde/Cde	2935	32.26
0	0	+	cdE/cde, cdE/cdE	2257	11.12
0	+	+	Cde/cdE, CdE/cde	38	22.60

c^v appears to be transitional between C and c, for it reacts with all anti-c sera but also with some anti-C sera. C^w, C^x, E^w can be recognized by the use of the specific antisera; of these alleles C^w is the least rare, being present in some 2.5% of white people. The position of f and of the antigen V is not perfectly understood at the present time.

risk, and others like it, is not one to be taken lightly; in fact it is only another of the many reasons why unnecessary transfusions, particularly in women, must be condemned.

Table IV describes our experience with what is admittedly selected material: some 550 specimens referred either because they possessed useful antibody titres or because of some doubt as to the

TABLE IV.—Rh ANTIBODIES FOUND IN REFERRED MATERIAL 1956 - 1957; 1958

Specificity	*Single antibody*	*Multiple antibodies*
Anti-D	268	
Anti-C+D	148	21
Anti-D+E	8	0
Anti-C+D+E	3	0
	Total anti-D: 437	
Anti-c	24	7
Anti-E	17	4
Anti-c+E	6	3
	Total anti-c and/or anti-E: 61	
Anti-C	4	0
Anti-C^w	1	1
Anti-e	2	2 (hæmolytic anæmia)
Anti-K	12	10
Anti-Fy^a	11	15
Anti-Le^a	7	0
Anti-S	1	5
Anti-M	0	4
Anti-P	2	1
Anti-Lu^a	0	1
Anti-Jk^a	0	3

specificity of the antibodies present. The fact that 12% of all Rh antibodies were anti-c and/or anti-E cannot be ignored. Both of these antibodies are almost invariably formed in Rh-positive people; anti-c in particular is a not uncommon cause of hæmolytic disease of the newborn.

It is normal practice, when describing blood group systems, to place them in the order of their discovery, but that is not the order of their importance in blood bank work. Next in importance to the ABO and Rh systems are the Kell and Duffy families. Of the atypical antibodies occurring with or without anti-D in Table IV, anti-K and anti-Fy^a were each present in about 4% of specimens; these two antibodies account for some 30% of all antibodies other than anti-D.

KELL SYSTEM

Anti-Kell was first discovered by Coombs, Mourant and Race, in 1946[14] in the serum of a mother whose infant was affected with hæmolytic disease of the newborn; this discovery was the first important one since the origination of the Coombs test. The number of examples of anti-Kell that have been found are evidence that the Kell antigen is an effective one, for only some 9% of white people are Kell-positive and the chance of a Kell-negative person's receiving one bottle of Kell-positive blood is only 1 in 11. Many severe and even fatal hæmolytic transfusion reactions due to anti-Kell have been reported, and it is also a not insignificant cause of hæmolytic disease of the newborn. Only some half-dozen examples of anti-k or Celano have been found, but here the problem is to find compatible blood, for only one person in 500 is a homozygous Kell-positive subject.

Anti-K was saline-active at both 20 and 37° C. in 40% of our specimens and reacted with albumin-suspended cells in over 75% of cases. The indirect anti-globulin test is, however, the only reliable way of demonstrating anti-K.

At this stage, the subject of unmatched Rh-negative, hæmolysin-free, group O blood might be mentioned. That group O blood may be dangerous to recipients of other ABO groups has been pointed out; that blood containing the antigen c is dangerous when transfused to persons homozygous for the antigen C—some 18% of all Rh-positives—is also clear; but what if the donor is Kell-positive and the recipient is Kell-negative, for one bottle of Kell-positive blood is very likely to provoke the formation of anti-Kell. Are any more contraindications to the use of unmatched blood required to stop this pernicious custom? Lewis and Chown[15] have suggested that all donors should be typed with anti-K, so that Kell-negative blood may be freely available for emergencies and for transfusions to Kell-negative women and Kell-positive donors virtually excluded from the panel. I do not believe that we should assimilate all the implications of this idea until strict regulation of blood transfusion therapy has virtually eliminated the "unnecessary" transfusion and prevented the administration of blood before the compatibility test has been completed. For the present, however, it is practicable to ensure that all Rh-negative blood issued for emergency use is Kell-negative.

DUFFY SYSTEM

Anti-Fy^a was first found by Cutbush, Mollison and Parkin, in 1951.[16] About 65% of people are Fy(a+). Anti-Fy^a is usually demonstrable only by the indirect anti-globulin method, but a small number of samples will be encountered that will react with saline or albumin-suspended cells or with trypsinized cells.[17] We have recently seen several such antisera; most reacted better at 20° C. than at 37° C., and one gave a distinct dosage effect at 20° C. Anti-Fy^a has been reported as the cause of many hæmolytic transfusion reactions, but only several cases of mild hæmolytic disease of the newborn due to this antibody have been found.[18] Several examples of anti-Fy^b[19] have now been discovered, but this antibody is of little clinical importance.

OTHER SYSTEMS

Table V shows the more important recognizable antigens and the antibodies known or suspected to be a cause of hæmolytic transfusion reactions or of hæmolytic disease of the newborn; apart from anti-Le^a, and perhaps anti-S, they are all of rare occurrence. It is worth bearing in mind that in very rare cases the only source of compatible blood may be the parents or siblings of the patient.

HÆMOLYTIC TRANSFUSION REACTIONS

The whole purpose of blood transfusion is to transfuse blood that will survive in the recipient's circulation for approximately the normal life-span of the cells, which is in the region of 110 days. Much will depend, of course, upon the length and temperature of storage, and upon the preservative used, but if the life-span of the donor cells is markedly curtailed an incompatible transfusion has probably been administered. There are various clinical grades of reactions to incompatible blood, the signs and symptoms of which largely depend upon the quantity and the effectiveness of the offending antigens and upon the opposition, both immediate and sustained, which they encounter in the recipient.

TABLE V.

		Antibodies that have or may have caused	
System	*Antigens recognizable in white people*	*Hæmolytic transfusion reactions*	*Hæmolytic disease of the newborn*
MNSs	M,N,S,s	Anti-S, Anti-U	Anti-M, S, s
P	P_1 (P), P_2 (p), p	Anti-P_1 (P)	
Lutheran	Lu^a, Lu^b	Anti-Lu^b	
Lewis	Le^a, Le^b	Anti-Le^a	Anti-Le^a
Kidd	Jk^a, Jk^b	Anti-Jk^a, Anti-Jk^b	Anti-Jk^a, Anti-Jk^b

A detailed description of the clinical manifestations of such reactions is outside the scope of this paper, but I would warn that the detection of a minor type of reaction today will in all probability prevent the occurrence of a more severe reaction tomorrow. Should the hæmoglobin response following transfusion be less than anticipated—in the absence of other obvious causes—or should the recipient experience a chill (rigors) and particularly should there be any nausea or vomiting, then such signs are the signal for a detailed serological investigation to search for any trace of irregular antibody. But it must be remembered that immediately after a reaction the available antibody may have been utilized in attacking the donor cells, with the result that no demonstrable quantity may be present in the serum; a further sample must therefore be obtained 5-10 days later.

COMPATIBILITY TEST

To obtain optimum survival of the donor cells in the recipient's circulation, laboratory tests before transfusion attempt to ensure that there is no apparent incompatibility between the donor cells and the recipient's serum. Antibodies vary so greatly in their characteristics that no single test will detect all examples of all types of antibody. An adequate compatibility test, then, must consist of more than one technique: firstly, a test at room temperature to detect "cold" antibodies; secondly, a test at 37° C., using albumin-suspended cells, to detect "warm" complete or incomplete antibodies; thirdly, the indirect anti-globulin method to detect "Coombs'-active" antibodies; finally, an auto-agglutinin control test at both temperatures. But these techniques are of little use unless the blood group antigens from the pilot tubes have lost none of their effectiveness during refrigeration; after storage for more than seven days the blood group antigens on cells from clotted blood are, in general, weaker than in blood taken into A.C.D. The answer is to use A.C.D. in the pilot tubes. The so-called "minor match" cannot be done if serum from the donor is unavailable, but should it ever be done? If the donor blood has been screened to exclude atypical antibodies, there is little point to the test; the only occasions on which it might be used are the infrequent transfusions of heterologous group blood, and here the usual method, using undiluted serum rather than serum diluted 1 in 50, gives no useful information.

There is, of course, much more to compatibility testing than the choice of suitable techniques. There must be a system which starts when the requisition is received and only ends when the blood is issued from the laboratory, a systematic diminution—but not, unfortunately, elimination—of human, technical and clerical errors. Table VI outlines some of the essentials.

TABLE VI.

Form	*Essentials*
Requisition.....	Patient's identity; surname, initials, Mr., Mrs., or Miss; ward and hospital number. Relevant obstetrical and transfusion history. Initials of person taking blood sample, signed by a physician.
Specimen label...	Patient's identity proved to technician by floor nurse. Labelled at bedside with full identification.
Worksheet.....	Records the actual laboratory results and their interpretation. Initialled by each technician working on case.
Bottle tag.....	Must show patient's identity and bottle group and serial number. Is put on after reading results.
Issue voucher....	Designates bottles satisfactorily cross-matched. Initialled by technician who makes final check of all particulars before bottles leave laboratory.

But the technician doing compatibility tests can make or mar the overall systematic approach. If unusual reactions are not to be missed or disregarded as unimportant, the technician must remember two things. Firstly, results that are inexplicable to one technician may have a logical explanation to a more experienced worker; secondly, there is no margin of error in blood bank work—the outcome of the transfusion is the final check of the laboratory results.

SUMMARY

Each bottle of blood contains more than one blood group antigen towards which the recipient may be antagonistic—in an immunological sense. The result of past antipathies will be detected by the compatibility test when properly performed, but curtailment of the "unnecessary transfusion" is the only way to minimize future risks for the individual recipient.

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Association Notes

THE CANADIAN MEDICAL RETIREMENT SAVINGS PLAN

Beginning with this edition, the quarterly report on C.M.R.S.P. activities will be printed one month after the end of each quarter. Thus, future information will be printed in issues of April 1, July 1, October 1 and January 1.

On November 30, contributions totalling $709,448 were transferred to the Plan. This brings the total for the first three-quarters of 1958 to more than $1,180,000 and the total of all contributions since the inception of the Plan to more than $3,100,000.

Common Stock Fund—Unit Value

The appreciation in our common stock holdings together with dividends and interest resulted in an increase in the value of each common stock unit from $11.08 on August 31 to $11.82 on November 30.

Notice to Non-Participants

To obtain more information about C.M.R.S.P., please write to The Association office at 150 St. George Street, Toronto. Brochures and other informative literature are available on request. The basic outline of C.M.R.S.P. is simple and extremely flexible, and participation will enable you to obtain tax relief now on savings which you invest to provide retirement income.

CANADIAN MEDICAL RETIREMENT SAVINGS PLAN
COMMON STOCK FUND

Holdings Valued at Closing Prices, November 30, 1958

No. of Shares	*Description*	*Nov. 30, 1958 Value*
Canadian Stocks:		
1500	Bank of Montreal	$79,500.00
600	Bank of Nova Scotia	43,050.00
1100	Canadian Bank of Commerce	64,625.00
1000	Royal Bank of Canada	74,750.00
900	Toronto-Dominion Bank	47,250.00
900 Rts.	Toronto-Dominion Bank Rights	3,330.00
500	Distillers Corp.—Seagrams Ltd.	16,187.50
500	Hiram Walker Gooderham & Worts.	16,812.50
800	Canadian Breweries Ltd.	28,200.00
1400	Molson's Brewery Class "A"	31,150.00
800	Building Products Ltd.	32,000.00
1000	Canada Cement	34,750.00
1500	Canadian Industries Ltd.	25,687.50
400	Canadian Westinghouse	20,450.00
500	Algoma Steel Corp.	16,937.50
500	Steel Co. of Canada Ltd.	34,312.50
450	Confederation Life Association	73,125.00
300	Manufacturers Life Insurance Co.	75,900.00
1500	Loblaw Companies "A"	51,187.50
1600	Simpsons Ltd.	51,400.00
800	Zellers Ltd.	27,600.00
500	Asbestos Corporation	17,750.00
100	Aluminium Ltd.	3,062.50
500	Hollinger Consolidated Gold Mines Ltd.	14,437.50
700	Moore Corporation	60,287.50
1000	Page-Hersey Tubes	31,750.00
175	Dominion Glass Co.	14,437.50
1000	British American Oil	39,250.00
600	Imperial Oil	26,400.00
300	McColl Frontenac	18,375.00
1000	Consolidated Paper	42,500.00
500	Great Lakes Paper	19,000.00
500	Howard Smith	18,875.00
1000	Powell River Co.	38,000.00
1000	St. Lawrence Corporation Ltd.	17,125.00
800	Interprovincial Pipeline	37,200.00
300	Calgary Power	23,475.00
600	Gatineau Power	22,950.00
900	Shawinigan Water & Power	29,587.50
500	British Columbia Power Co.	18,000.00
1500	Consumers Gas Co.	51,187.50
500	Trans Canada Pipe Lines Ltd.	13,937.50
2000	Union Gas Co.	32,000.00
1000	Bell Telephone Co. of Canada	42,000.00
	TOTAL Canadian Stocks	$1,479,792.50
United States Stocks:		
600	Dow Chemical	43,950.00
150	E. I. Dupont de Nemours	29,700.00
700	General Electric	48,737.50
300	Owens Illinois Glass	25,537.50
100	International Business Machine Co.	44,600.00
700	Standard Oil of New Jersey	41,125.00
	TOTAL U.S. Stocks	$233,650.00

Canadian Equivalent: 3 3/8% discount on U.S. Dollar $225,764.31

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Value of Stocks	
Total Canadian Stocks	$1,479,792.50
Canadian Equivalent of U.S. Stocks	225,764.31
Total Value of Stocks	1,705,556.81
Cash dr.	5,901.10
Dividends declared but unpaid on stocks selling ex dividend:	5,319.03
	$1,704,974.74
Less: Administration Expense Allowance 1/8% quarterly:	2,131.22
Net Value of Fund	$1,702,843.52

On the basis of 144,011.461 outstanding units, the unit value is $11.82. Contributions made to the Common Stock Fund during the three months prior to November 9 will purchase units at this rate.

COMMITTEE ON ECONOMICS

The Committee on Economics of the Canadian Medical Association met at C.M.A. House, Toronto, on Friday and Saturday, November 21 and 22, 1958, with Dr. R. K. Thomson of Edmonton in the chair. There was a very full agenda, which necessitated a night meeting on Friday as well as an early start on Saturday.

The Committee discussed a document prepared by the Canadian Medical Association secretariat, in conjunction with the Association solicitor, in which an attempt was made to delineate the matters which ought to be considered in the negotiation of contracts by physicians, individually or collectively, for the provision of medical services.

A report was also submitted and discussed on the standardization of insurance claim forms. The insurance industry's point of view was presented to the Committee by Dr. C. B. Gossage of Toronto, who was present by invitation.

The Committee received and discussed reports on the status of hospital insurance in each of the provinces with particular reference to the diagnostic services involved, the method of financing, the premium rates, the mode of payment of physicians, and any plans in progress for an extension of health services. The various problems arising out of the implementation of hospital insurance programs were also debated, such as the responsibilities of the profession as regards admission and discharge of patients, the inadequacy of present facilities for chronic conditions, the charges to be levied by out-patient departments and the effects of such charges on private radiological services.

A report was heard on the Newfoundland Children's Health Service with particular reference to recent negotiations over payment of pædiatricians.

Mr. B. E. Freamo, assistant secretary (economics) of the C.M.A., reported progress on the part of the Relative Value Studies Committee. He hoped that by the end of January this Committee would have sufficiently developed the factors involved in the study to permit the sending out of a proforma for suggestions by provincial medical associations. Once this proforma was agreed, a points system could be worked out.

A very brief interim report on the studies of the C.M.A. subcommittee on T.C.M.P. was accepted without debate. Mr. Freamo then reported the activities of the Bureau of Economics at C.M.A. House. He said that the library on medical economics would soon get under way, and that he expected soon to be able to furnish provincial medical associations with a newsletter containing abstracts of items appearing in the medical press on medical economics. He spoke of the serious gaps in documentation at C.M.A. House on provincial matters and on affiliated societies. It was hoped in particular that affiliated societies would find it possible to furnish the Bureau of Economics with any material which the society possessed pertaining to medical economics.

The Committee discussed the arrangements for a survey of salaried physicians across Canada. The Canadian Medical Association is anxious to maintain very close relations with this growing segment of the medical profession, and as a step towards this a survey (which will be described in the January 15 issue of the Journal) is to be currently undertaken.

Much of Saturday was taken up with a detailed review, analysis and forecast of the interest of government in the practice of medicine. A working document had been prepared by Mr. Freamo which outlined the history of the interest of government in health insurance in Canada, the problems presently facing the C.M.A. and its divisions in this area and the alternative policies which the C.M.A. might adopt if health insurance is further extended.

MEDICAL SOCIETIES

CANADIAN LIFE INSURANCE MEDICAL OFFICERS ASSOCIATION

At the meeting of the Canadian Medical Association in June of last year, the Canadian Life Insurance Medical Officers Association was accepted as an affiliated body. It consists of doctors who are employed by life insurance companies in Canada to do their head office medical work. These medical directors are on a full-time or part-time basis. Many have done and some still do general practice and the various medical specialties. A considerable number do only consulting medicine apart from the life insurance work.

The work in the head office consists mainly of attempting to assess the insurability of individual applicants. The material on which these opinions are based is obtained from a variety of sources. The medical history and medical examination, as well as certain laboratory procedures, of course form the largest source of information. The conclusions reached from the study of long-term mortality rates must frequently be reconsidered in view of the rapid changes which have taken place as a result of the effect of modern medical treatment on the course of disease. As medical diagnostic procedures improved, it has been possible to regroup impaired applicants on a much more accurate basis. Thus, by improving the knowledge of prognosis and the ability of selection, it has been possible to insure many people at satisfactory rates who were considered declinable not long ago. The application of extensive medical knowledge is necessary to accomplish this task. The medical officers also provide minor medical services and periodic examinations for

employees and may perform examinations for life insurance.

The Canadian Life Insurance Officers Association donates considerable money every year for medical fellowships in the universities and also to support promising medical schemes that might fail because of lack of funds in the early stages of their development. Certain medical directors act on the selection committees.

It is realized that at times there have been points of friction between the life insurance industry and the medical profession at large. It is hoped that through the Canadian Life Insurance Medical Officers Association, closer contacts with the profession can be made and freer discussions take place so that problems may be settled shortly after they arise.

A great deal of insurance medical knowledge, experience and statistical information is gathered together in the specialized publications of the various associations of medical directors in Canada and the United States. This material is often not readily available to the general medical profession although it contains much that would be of interest and that might be of very decided help. It is hoped that in the *Journal* pertinent studies and summaries may be presented from time to time. Furthermore, any questions that may be asked through letters will be answered by the best available authorities.

The specialty of life insurance medicine seems to have been kept separate from general medicine. The correction of this should be of benefit to all concerned.

PUBLIC HEALTH

EPIDEMIC OR UNUSUAL COMMUNICABLE DISEASES IN CANADA

During the week ending November 29, 1958, the Epidemiology Division of the Department of National Health and Welfare, Ottawa, received the following surveillance reports of epidemic or unusual communicable diseases.

Poliomyelitis

The 1958 total to November 22 for Canada now stands at 215 paralytic cases. At this time a year ago there were 167. This increase is due basically to the large number of cases reported in Manitoba, accounting for 47% of the cases in Canada. Quebec was the only other province with a higher incidence than in 1957, accounting for 20% of the total number of cases. In Manitoba, 85%, and in Quebec, 96% of cases occurred in non-vaccinated individuals. The number of deaths to November 22, 1958, is 17 against 24 at this time in 1957. Manitoba accounts for about 60% of all deaths. No deaths were reported in Quebec. The case fatality rate this year is 79 against 143 last year, being the lowest ever reported, except in 1955 (65).

During the first three weeks of November, only 6 cases were reported in Canada; 48 cases were reported in October. Manitoba has not reported any cases since November 1.

Infectious Hepatitis

Alberta

Taber, Alta.—Thirty further cases of infectious hepatitis are reported in and around Taber. This is a continuation of the epidemic reported on September 24.

Conjunctivitis

Dixonville, Alta.—An outbreak of conjunctivitis has occurred in the school at Dixonville, affecting 50 people (teachers, pupils, parents).

Measles

Consort, Alta.—An outbreak of 112 cases of measles, affecting about 20 to 25% of the total population, has occurred.

Indian and Northern Health Services

Sanmaur, P.Q.—Information has been received regarding the measles epidemic at Weymontachie Reserve. About 40 cases have occurred so far, 6 of which are complicated by bronchopneumonia and 10 by otitis. All the Indians on the Reserve appear to be suffering from impetigo. Several cases have been sent to La Tuque Hospital.

Typhoid Fever

Tuktoyaktuk, N.W.T.—Two cases of typhoid fever, in a mother and son, have occurred in this settlement. Both were evacuated and hospitalized in Aklavik. Attempts to find carriers have so far failed. The whole community has been vaccinated with TABT.

Pelican Lake Reserve, Sask.—Three cases of typhoid fever in the Metis settlement were reported. All school children in the nearby reserves were vaccinated with TABT.

Infectious Hepatitis

Fort Alexander Indian Reserve, Man.—Six cases of infectious hepatitis are reported.

Influenza

Newfoundland—At the R.C.A.F. Station, Goose Bay, there is a smouldering epidemic of influenza with primary gastro-intestinal symptoms and occasional neurological complications.

About 14 cases have occurred so far, presenting symptoms including headache, dizziness, pyrexia, abdominal pains, nausea and vomiting, with occasional meningismus. The outstanding symptoms are dizziness and gastro-intestinal disturbances. Clinical findings are essentially negative. Most of the patients affected are children under 12.

Infectivity appears low and there is no sweeping epidemic pattern at this time. The symptomatology is described as suggestive of aseptic meningitis due to Coxsackie or ECHO virus. Arrangements have been made to have serum, throat washings and stool specimens forwarded to the Laboratory of Hygiene, Virus Division.

Trichinosis

British Columbia—One case of trichinosis affecting a woman has been reported.

LETTERS TO THE EDITOR

TUBERCULIN TESTING

To the Editor:

Readers may be interested in steps being taken by the National Sanitarium Association to promote the wider use of tuberculin testing in its tuberculosis case-finding program. Letters were sent recently to all physicians practising in the area served by the Association. The substance of the letter was as follows:

The National Sanitarium Association believes that if further major progress is to be made in tuberculosis control, the tuberculin test must be universally applied. There is good evidence that the number of non-reactors

to tuberculin in this area has now increased to a level where the use of the tuberculin test becomes practical on a large scale as the initial screening procedure in mass tuberculosis detection programs.

The primary objective in increasing the use of the tuberculin test is to achieve better control of tuberculosis through identification of positive reactors in our population, through detection of convertors and by improving our knowledge of the infection rates at various age levels.

Since a reaction to tuberculin indicates that tuberculous infection has occurred, it points to the need for periodic chest films and these should be more frequent if the individual is known to be a recent convertor.

During the last four years the National Sanitarium Association has urged the public to have family physicians give them tuberculin tests regularly. It is now apparent that a much wider application of tuberculin testing is needed. Accordingly, the Association is making the following arrangements:

A. *Mass Surveys:*

Tuberculin testing will be offered during the regular surveys in communities and industries every second year. A team, in advance of the mobile x-ray unit, will offer intracutaneous tuberculin tests (Mantoux tests), using 1/20 mg. of old tuberculin. Later, when the x-ray unit arrives, a nurse will interpret the test and give the individual a permanent certificate showing the result. At the same time chest films will be offered to the following:

1. Reactors to tuberculin.
2. All those over 40 years of age including non-reactors.
3. Individuals of 15 years of age and over who have failed to have a tuberculin test.

It is to be noted that chest films will not be recommended for non-reactors under 40 years of age.

B. *Tuberculin Testing for Patients Referred by Physicians:*

Tuberculin testing is available at the Gage Institute Chest Clinic, and at its east and west branches in Toronto which are all full-time chest clinics. At these clinics, patients will be given tuberculin tests and/or screening films, or clinical examination as prescribed by the referring physician. Tuberculin tests will not be done on patients referred by physicians for chest x-ray only. Physicians referring patients have been requested to send written instructions with the patients, and to make appointments for the type of examination desired. Reports of tuberculin tests on referred patients will be mailed to physicians, and a certificate showing the result will also be given to the patient in the hope that it may be available for reference at future examinations.

In summary, the objectives of the Association are as follows:

1. Yearly tuberculin tests for all non-reactors.
2. Yearly chest x-ray examinations for all tuberculin reactors—more frequently for recent convertors.
3. Yearly chest x-ray examinations for all persons of 40 years of age and over, including non-reactors, because of the possibility of a false negative tuberculin test and the increased possibility of non-tuberculous chest disease in this age group.
4. Chest x-ray examinations every second year for those of 15 years of age and over who for any reason do not have tuberculin tests.
5. Provision of facilities for tuberculin testing, chest films and/or clinical examinations for patients referred by family and industrial physicians and medical officers of health.

Physicians in the area served by the Association are responsible for discovering, either directly or indirectly, much of the tuberculosis found. It is sincerely hoped that they approve of the above policy and will give it their support.

H. T. McCLINTOCK, M.D.,
Director.
Gage Institute Chest Clinic,
National Sanitarium Association,
223 College Street,
Toronto 2B,
November 19, 1958.

LEAD POISONING

To the Editor:

The communication in your issue of October 15, 1958, "A Comparison of Intravenous Calcium Disodium Versenate and Oral Penicillamine in Promoting Elimination of Lead" by Cecil E. C. Harris, was of interest to me because I have been intimately associated with the control of lead absorption in a big lead producing industry for some time.

Before commenting on the communication, a brief résumé of my work in connection with lead is in order. The Consolidated Mining and Smelting Company employs about 500 men in the smelting and refining of lead. These men are checked for signs of lead absorption regularly by means of a blood smear in which the number of stipple cells are estimated. Periodic estimates of the quantity of lead in their urines and blood are also done. When these values approach abnormal levels, the men are moved out of the lead area into another section of the industry. Because of improved ventilation, the number of men on movement now is very small. This has not always been the case.

Some years ago, before the full effect of good ventilation was realized, in spite of our best efforts a number of men absorbed toxic quantities of lead. Those with mild symptoms were treated without benefit of the chelating agents; those with more severe symptoms were treated orally with calcium disodium versenate —or in one series with penicillamine. I was unable to detect any advantage in either drug and was puzzled when some of the cases failed to improve clinically in spite of excretion figures in the range 1500-2500 micrograms per litre. This suggests that Dr. Harris's figures should be headed micrograms rather than milligrams.

The discrepancy between symptoms and urinary findings may be explained on poor absorption of versenate (and penicillamine) from the gut as quoted by Dr. Harris. This does not explain the high urinary values following the giving of the drugs. George[1] stated that there is evidence to show that versenate given orally merely transfers the gastro-intestinal excretion to the genito-urinary tract without affecting total excretion. As the lead is not ionized, this trans-

fer does not exaggerate symptoms. In fact, there may be and often is an improvement which is explained on psychological grounds.

Further in the communication Dr. Harris suggests the prolonged use of penicillamine in de-leading and raises the question "as to the advisability of giving short courses to workers exposed to the hazard to prevent accumulation in the tissues".

These questions were considered here. The effects of the indiscriminate or prolonged use of versenate were pointed out by Kehoe.[2] This, like penicillamine, is a chelating agent which, when making the lead ion inactive and aiding its excretion, might have the same effect on other ions necessary to the body economy.

Though Kehoe's surmise is important and must not be disregarded, other reasons for a note of caution in the routine use of these drugs must be given. In any such program there would be a tendency for operators to put value beyond its worth on the drug. This might easily lead to carelessness in housekeeping and neglect in ventilation, both of which at first sight appear so costly. In the long run, any departure from first principles is always much more expensive than good solid progress. Not only do machines wear out faster, but what is most important, there is either a heavy labour turnover or the health of the men suffers.

May I conclude by saying that there is reason for saying versenate or penicillamine should only be used for lead poisoning severe enough to interfere with work; neither drug should be used as routine, especially to replace good housekeeping or adequate ventilation.

W. S. HUCKVALE, M.D.,
Medical Consultant,
Safety and Hygiene Department,
The Consolidated Mining and Smelting
Company of Canada Limited,
Trail, B.C.,
November 25, 1958.

REFERENCES

1. GEORGE, W. E.: Verbal communication (Consolidated Zinc Corporation, Sydney, Australia).
2. KEHOE, R. A.: *J. A. M. A.*, 157: 341, 1955.

To the Editor:

I must thank Dr. Huckvale for pointing out the typographical error in the tables on lead excretion which should be measured in micrograms rather than in milligrams.

As to the question of prophylaxis, none can dispute Dr. Huckvale's contention that ventilation and other environmental measures must be given first consideration. It is significant that no further cases of clinical plumbism have presented since the industries concerned were made aware of the causative defects in their "housekeeping".

I am indebted to Dr. Huckvale for his succinct opinion on the advisability or otherwise of periodic courses of de-leading for exposed workers and my only comment is that, so far at least, prolonged treatment of Wilson's disease does not appear to have resulted in material imbalance as regards other ions.

There is no dispute, I would agree, that the treatment of choice for overt cases of plumbism seems at present to be versenate or penicillamine with preference probably swinging to the latter.

St. Mary's Hospital,
3830 Lacombe Avenue,
Montreal 26,
December 4, 1958.

CECIL HARRIS,
M.D., F.R.C.P.

CONE BIOPSY AND HYSTERECTOMY

To the Editor:

I have read with interest Dr. David Osoba's review of "Febrile Morbidity in Relation to Cone Biopsy followed by Hysterectomy" (*Canad. M. A. J.*, 79: 805, 1958).

It has long been a custom to avoid an abdominal hysterectomy following electro-cauterization or electro-conization of the cervix except when the hysterectomy is done immediately. (It might be necessary to explain that this combination of procedures is done in some cases where a total hysterectomy is expected to be extremely hazardous and a supravaginal operation is planned.)

The second precaution in the management of chronic cervicitis is to avoid the cauterization or conization of the cervix prior to an expected menstrual period. I am aware, myself, of a case of sudden death due to overwhelming septicæmia in a patient in whom this precaution had been overlooked.

These remarks lead to my two inquiries, which I hope Dr. Osoba will be able to answer:

1. Do the statistical results of your survey lead you to believe that a quick section examination of the tissue obtained by cone biopsy, followed by hysterectomy within 24 hours or less, would negate the morbidity and mortality risks?

2. Does there appear to be any relation between the severity of the febrile response to hysterectomy and the proximity of the cone biopsy and/or hysterectomy to the menstrual periods?

Again I wish to congratulate Dr. Osoba on his fine and meticulous survey, and hope that he may be able to cast more light upon the subject.

4857 Kingsway,
Burnaby, B.C.,
November 25, 1958.

W. F. BALDWIN, M.D.

To the Editor:

I would like to make the following comments in reply to Dr. Baldwin's questions concerning febrile morbidity following cone biopsy and hysterectomy.

In my study there were no cases in which the interval between biopsy and hysterectomy was 24 hours or less. However, I have knowledge of three consecutive patients treated in this manner soon after the completion of my study. None of these three patients experienced any postoperative febrile morbidity. This number of patients is, of course, too small to be an indication of what may happen in a larger series.

There is one practical difficulty which arises when one attempts to perform hysterectomy within 24 hours of conization. Since frozen section is not reliable in making the diagnosis (personal communication from Drs. H. F. Fidler and H. H. Pitts, chief pathologists at Vancouver General Hospital and St. Paul's Hospital, Vancouver, respectively) the tissues obtained at conization must be examined in the usual way (H. and E. staining of paraffin sections). A cone biopsy yields, on the average, 100 to 120 sections. Since practically all the sections must be examined to exclude invasive carcinoma, it is a time-consuming job and places an extra strain upon the pathologist to examine them all carefully within a short time period.

I regret that I am unable to make any comment on Dr. Baldwin's second question dealing with severity of febrile morbidity and the proximity of cone biopsy and/or hysterectomy to the menstrual periods. At the time of the study I was not aware of the possibility that this factor may play a role in morbidity and therefore did not pay particular attention to it.

DAVID OSOBA, M.D.

812 West 14th Ave.,
Vancouver 9, B.C.,
December 6, 1958.

THE LONDON LETTER

(From our own correspondent)

MEDICAL EMIGRANTS

Established general practitioners are emigrating at a rate of just over 5 per 1000, according to a memorandum presented by the British Medical Association to the Royal Commission which is now considering the remuneration of doctors and dentists. This figure is based upon an analysis of the records of 124 of the 139 executive councils in England and Wales. In the areas covered by these councils just over 15,000 doctors practise. The detailed figures show that 452 established general practitioners have emigrated from these areas since the inception of the National Health Service in July 1948 – mainly to other Commonwealth countries. The rate has varied from year to year – the figure quoted being that for 1957 – but the average is 3.13 per 1000. The number of unestablished general practitioners and of unestablished hospital doctors who emigrated is said to be far greater than the figures quoted for established general practitioners. According to *The Lancet*, "neither the wish for secure employment nor the wish for a better living is the chief motive of all" who emigrate. "The potential emigrant," it contends, "gazing across the Atlantic, sees practice pursued with vigour and vitality (although, admittedly, not always with perspicacity), and he sees research most lavishly supported. Nor are these the only attractions. The example of many who have gone tells us that full scope and full honour are accorded at once to those with merit, regardless of their age. In this country, on the other hand, underlying the sense of frustration among younger doctors is a conviction that we are not making nearly full use of our profession's resources; and this discontent crystallizes round the seniority of our leaders."

THE STATUS OF CARDIOLOGY

"The time has come when the Ministry of Health could with advantage give the same official recognition to cardiology as it does to neurology and certain other specialties," according to the committee of cardiology of the Royal College of Physicians of London. The minimal time recommended for the training of a cardiologist is five years, consisting of two years as registrar in a suitable general hospital, two years in a cardiac department, and one year in research. There should be a department of cardiology in one of the main teaching hospitals of each medical school, under the care of a cardiologist with charge of beds. Particular stress is laid upon the necessity for close liaison with cardiac surgeons, pædiatricians and obstetricians. A cardiologist should also be appointed to every major hospital centre in the country and to every hospital where cardiac surgery is performed. In the case of the latter, "he should share the responsibility for the selection of patients for cardiac surgery, for their care in hospital and for their continued supervision." It is further recommended that in every area where access to a major hospital centre is not easy, one or more cardiologists should be appointed among the physicians working in the area.

CENTENARY OF THE G.M.C.

It was with justifiable pride that Sir David Campbell, the president, reviewed the record of the General Medical Council at the Council's centenary dinner which was held at the Mansion House on November 27. Since its first meeting on November 23, 1858, the Council has had to stand up to many criticisms both from within and without the profession, but an impartial review of its record, as so admirably described by Mr. Walter Pyke-Lees, the registrar of the Council, in his short history of the Council, shows that the country has every reason to be grateful to it. As Sir Donald MacAlister, its greatest president, pointed out many years ago, "the two great functions which the Council in the public interest discharges are, first, to prevent the unfit from gaining access to the Register, and, secondly, to remove the unworthy from it". But it has done much more than this – it has played an outstanding part in raising the standard of education. If, at times, it has erred on the side of conservatism, this has all been to the good, especially as it has never stood in the way of experimentation in teaching methods, provided this involved no risk of the standards being lowered in the schools proposing to experiment.

POISONING—SUICIDAL AND ACCIDENTAL

The detailed analysis of cases of suicidal and accidental poisoning in England and Wales in 1956, just published by the General Register Office, shows that fashion changes little in this morbid field. Of the 860 deaths by suicidal poisoning, 702 were caused by "analgesic and soporific substances". The vast majority of these, of course, were due to barbiturates, but aspirin was responsible for 147. In the list of "other solid and liquid substances" responsible for the re-

maining 158 deaths by suicidal poisoning, cyanides accounted for 32, Lysol for 24, strychnine for seven, and insulin for one. Among the 356 deaths due to accidental poisoning barbiturates again headed the list, being responsible for 223 deaths. Aspirin and salicylates come next, being responsible for 39 deaths. The only two deaths attributed to ferrous sulphate occurred in the age-group 1 to 4 years. The total number of deaths from accidental poisoning in children under the age of 15 and 16 was —11 boys and 5 girls. London, December 1958. WILLIAM A. R. THOMSON

OBITUARIES

DR. HOWARD HAMPDEN BURNHAM, 67, died on November 15 in the Toronto General Hospital after a short illness. He was born in Toronto, and attended Model School, Ridley College, and Upper Canada College. He obtained his medical degree from the University of Toronto in 1914. During this same year he enlisted in the Royal Canadian Army Medical Corps, being mentioned in dispatches and recommended for the D.S.O. while serving in the forces. Dr. Burnham's career as an otolaryngologist began in 1919. He spent three years doing postgraduate work at the New York Eye and Ear Infirmary, the Willard Parker Hospital and the New York Tonsil Hospital. Later, on a grant from the Banting Research Foundation, he did part-time research work. He was a member of the Canadian Medical Association and the American Academy of Ophthalmology and Otolaryngology.

Dr. Burnham is survived by his widow.

DR. WILLIAM EDWARD CHASNEY, 66, died on November 25. He graduated in 1922 from McGill University, obtaining his L.M.C.C. in the same year. Since 1943 he had carried on a general practice in North Winnipeg.

Dr. Chasney is survived by his widow.

DR. DAVID GARNET MORSE, who had practised in the Maple Ridge district of British Columbia for 46 years, died on October 29, 1958, after a brief illness. Dr. Morse was born in Lawrencetown, Nova Scotia, where his father was in medical practice. After attending Acadia University, he taught school for a year before entering medicine at McGill University, from which he graduated in 1910. After an internship in Bellevue Hospital, New York, he settled in Haney, B.C., in 1912, and had carried on a busy general practice until shortly before his death. Dr. Morse was coroner for the district for 40 years; medical health inspector for many years; and attending physician for the district provincial welfare infirmary until his death. He had served as secretary to the Maple Ridge Medical Staff since 1956. He took a deep interest in community affairs and was active politically. For the past ten years he had been president of the Maple Ridge—Pitts Meadows Boy Scouts Association.

Dr. Morse is survived by two sons, a daughter and eleven grandchildren.

DR. PERCY L. IRVINE died in the Toronto East General Hospital in November, after a brief illness. He was born in Hulbert, Ont., and graduated in medicine from the University of Toronto in 1920. He was a member of the Academy of Medicine and a past president of the Toronto East Medical Association. He was known widely in the east end of Toronto and had always practised in the city as a surgeon.

Dr. Irvine is survived by his widow and two daughters.

DR. HAROLD G. PINK, 54, of London, Ont., died suddenly while attending a medical convention in Cleveland, Ohio, on November 10. He was born in London, Ont., and attended the University of Western Ontario, interning at Victoria Hospital. He was active in the London Academy of Medicine, where he served as secretary in 1948 and president in 1950. While at Delaware, he served as Middlesex County coroner.

Dr. Pink is survived by his widow, one son and a daughter.

DR. GEORGE B. SNYDER, 88, died on November 16, in the Greater Niagara General Hospital. He was born in Abington, Ont., and graduated in 1900 from the University of Toronto. He had been in practice since that time. Dr. Snyder was a former president of the Niagara Falls Medical Society, chairman of the Niagara Falls Board of Education, and former director of the Guaranty Trust Company.

Dr. Snyder is survived by his widow and one son.

HARRY GUY RADCLIFFE DREW

A very unusual person, described by Sir Heneage Ogilvie in *The Times* of London as "a figure of national importance in British surgery", died in England on November 6. Mr. H. Guy Radcliffe Drew, who was 78 at the time of his death, was a man whose whole life was associated with design and manufacture of surgical instruments. Leaving school at the age of 14, he worked from then on to support his family, and educated himself in his spare time. He was for many years associated with the surgical instrument firm, Down Brothers of London, and later founded and became chairman of the Institute of British Surgical Technicians, an organization designed to provide surgical technicians with a training that would make them a group of skilled medical auxiliaries. He was also chairman and subsequently president of the Surgical Instrument Manufacturers Association. In an obituary notice, Sir Heneage Ogilvie said of him: "The continuous development of surgical technique, not alone in this country but in the English-speaking world, owes more to him than to most surgeons. He not only guided and developed the design and manufacture of surgical instruments as a special branch of engineering, but he followed its growth in most countries of the world. He worked to the highest possible standards. When Sheffield was unable to produce a steel fine enough for his requirements, he bought a works to make it for him. He always opposed the patenting of inventions in the sphere of surgical instruments. By his leadership during the years of development he raised the ethical standards of this new and growing trade to those of a profession."

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PROVINCIAL NEWS

BRITISH COLUMBIA

The Annual Scientific Session of the Section of General Practice of the B.C. Division of the Canadian Medical Association will be held at the Harrison Hot Springs Hotel, Harrison Hot Springs, March 19-21, 1959. Registrations: Dr. W. Douglas McCauly, 149 Kenneth Street, Duncan, B.C.

ALBERTA

The seventh Provincial Doctors' Bonspiel was held in Calgary on October 31 and November 1, 1958. The twenty-six rinks present from all parts of the province made the largest turnout for this event to date. The C. D. McBride trophy was won for the third time by Dr. M. Hankin of Thorsby. Others on his rink were Dr. D. Bell, Dr. C. M. Learmonth and Dr. N. Woywitka. The Calgary trophy was won by a rink skipped by Dr. G. McQueen; the Edmonton trophy by Dr. L. Grisdale's rink; and the Lethbridge trophy by Dr. Ian Ferguson of Medicine Hat. In addition to the curling, there was varied and excellent entertainment for the curlers and their wives.

Next year's bonspiel will be held in Edmonton, with Dr. J. M. Lees in charge of arrangements.

Dr. Olav Rostrup has been appointed professor of orthopædics in the University of Alberta Medical School.

The Alberta Association of Teachers of Retarded Children met in Red Deer on November 6 and 7. This organization was formed to co-ordinate the activities of the retarded children, and to formulate a set of standards for teaching in the province. Yearly assessments are made to determine the value of the various procedures and techniques.

On November 27, the Alpha Chapter of Alberta of the Alpha Omega Alpha Honour Medical Society was installed on the University of Alberta campus. The charter was conferred by Dr. W. L. Bierring of Des Moines, national president of the society, and accepted by Dr. Walter S. Johns, vice-president of the University, and Dean John W. Scott of the Faculty of Medicine. Dr. T. C. Routley, Canadian director of the society, presented the keys and certificates to the Charter members. Dr. E. P. Scarlett, recent chancellor of the University, conducted the meeting, and the guest speaker was Dr. J. Wendell Macleod, Dean of the Faculty of Medicine, University of Saskatchewan.

Charter members included eighteen from the faculty and eleven undergraduates. Attending the meeting were the four faculty members of A. O. A. from other chapters, together with a few members from elsewhere in Alberta. The Alberta chapter is the eighty-second in the A. O. A. society.

During the past few months the Alcoholism Foundation of Alberta, under the direction of Mr. J. George Strachan, Executive Director, has sponsored seminars for social workers in various Alberta centres to provide information about the problems of alcohol and alcoholism and to acquaint these workers with referral facilities. These activities are in recognition of the growing need to provide professional groups in the province with all the assistance and information needed.

The Alcoholism Foundation of Alberta was incorporated on September 27, 1951, under the Friendly Societies Act. In 1953 the first clinic and Provincial Administrative Centre was opened in Edmonton. A second clinic was established in Calgary in 1954 to serve more adequately the needs of the southern areas of the province.

The Foundation is a non-profit, private agency supported by the provincial and municipal grants, and membership donations from associations, companies and individuals. Through its two centres, the Foundation maintains broad programs of education, treatment and research. The goal of these programs is the prevention of alcoholism.

The chairman of the Medical Advisory Committee is Dr. John W. Scott, Dean of Medicine, University of Alberta, Edmonton. The chairman of the Subcommittee on Medical Treatment is Dr. G. R. Macdonald, Director of the Department of Laboratories, Misericordia Hospital, Edmonton. The chairman of the Research Committee is Dr. D. R. Wilson, Director of the Department of Medicine, University of Alberta Hospital, Edmonton.

At the seminar for social workers held in Edmonton, Dr. David M. Bell, Provincial Medical Director, and Dr. G. Donald Carson, Consultant Psychiatrist, took part in a panel discussion, "The team approach to the treatment of alcoholism: diagnosis, techniques and goals", with Mr. A. W. Fraser, Provincial Director of Treatment. At the Calgary Centre, Dr. E. W. Nation, clinic physician, Dr. F. W. Hanley, consultant psychiatrist, and Mr. J. D. M. Bliss, treatment supervisor, participated in the panel discussion. Other topics presented at the seminars were: "Alcoholism—nature and scope of the problem"; "Techniques and methods of dealing with the unique problems of the alcoholic and his family – the male alcoholic, the wife of an alcoholic, the alcoholic woman"; "Mobilizing community resources and a common denominator of understanding".

Workshops were also held in which participants had the opportunity to ask questions and have answers to specific problems.

Some of the seminars have been organized by Mrs. O. T. (Hanna) Lewis, Provincial Director of Education Services. From these seminars come key personnel to serve individually in a total community approach aimed at rendering maximum service to the alcoholic and those close to him, as well as arrangement of proper referrals and utilization of established facilities.

W. B. PARSONS

SASKATCHEWAN

A very successful Annual Meeting of the College of Physicians and Surgeons of Saskatchewan and the Saskatchewan Division of the Canadian Medical Association was held in Regina during the week of October 14. A pre-convention gathering in the form of a coffee party was held on the evening before the meeting, when those in attendance met for a social gathering. The business meetings were held Tuesday and Wednesday mornings, with clinical meetings Tuesday and Wednesday afternoons and all day Thursday.

The Munroe lecture, arranged through the courtesy of the Saskatchewan Division of the Canadian Cancer Society, in honour of the late Dr. F. D. Munroe, was given this year by Dr. R. W. Begg, Director, Cancer Institute, University of Saskatchewan. Dr. George M. White of Saint John, New Brunswick, and Dr. R. E. Beamish of Winnipeg, Manitoba, were the members of the visiting C.M.A. team who participated in the clinical program. Other clinical subjects were discussed by Dr. F. A. Holden of Regina, Sask., Dr. Harry Medovy of Winnipeg, Man., and Dr. E. A. Jones, Dr. J. G. McFetridge, and Dr. C. H. Crosby of Regina, Sask. The President of the C.M.A., Dr. A. F. VanWart, and the General Secretary, Dr. A. D. Kelly, were present and spoke to the members assembled. On the afternoon of October 15, the various sections of the College held their annual meetings.

The Annual Dinner of the College was held on October 15 and, in association with this, the Ritchie Cup competition. The cup was won this year by the Prince Albert and District Medical Society, while Dr. H. A. Hengen of Regina received the Dale Memorial Trophy as the best "actor". At the annual dinner and dance, held on October 16, His Honour, the Lieutenant-Governor of Saskatchewan and Mrs. Bastedo were guests of honour.

On October 17, the program was combined with the official opening of the new provincial laboratories in Regina. The Hon. J. W. Erb, Minister of Public Health, was chairman of the opening session with Premier T. C. Douglas as the guest speaker. In the afternoon a dedicatory clinical laboratory symposium was sponsored by the provincial laboratories of the Department of Public Health, with Dr. A. J. Rhodes of the School of Hygiene, Toronto, Dr. M. G. Israels of the Regina General Hospital, Dr. S. Barker of the University of Alabama, and Dr. D. W. Penner of Winnipeg, as speakers.

At the recent annual meeting of the Saskatchewan Hospital Association, Mr. C. E. Barton from Regina was elected president and Dr. A. L. Swanson of Saskatoon was elected vice-president. At this meeting several resolutions were passed which have some bearing on the medical profession. For example, the Hospital Association approved the carrying out by competently trained nursing personnel, under medical supervision, of venous puncture for the taking of blood samples and for the intravenous administration of fluids and drugs. It was also recommended that instruction in intravenous technique be initiated for registered nurses and in schools of nursing. It was further resolved that the Executive of the Saskatchewan Hospital Association approach representatives of the College of Physicians and Surgeons of Saskatchewan, and the Saskatchewan Registered Nurses Association, to obtain their agreement to a joint statement on the advisability of nurses securing blood samples for diagnostic purposes, starting and administering intravenous infusions, and injecting intravenous drugs.

It was also noted that minor surgical procedures on outpatients are not covered by the Saskatchewan Hospital Services Plan, unless they arise from an accident treated within the first 24 hours, and it was resolved that the Saskatchewan Hospital Association recommend to the Minister of Public Health that the Saskatchewan Hospital Services Plan include minor medical and surgical procedures as an outpatient benefit, as a further step towards the implementation of a complete outpatient service.

It was also resolved that the Hospital Association, while approving the principles of accreditation of nursing schools, recommend that the development and administration of such a program should be under the control of a joint committee composed of the Canadian Hospital Association, the Canadian Medical Association and the Canadian Nurses' Association.

Dr. John Orr, general superintendent and medical director of the Saskatchewan Anti-Tuberculosis League since 1948, ended 32 years' association with the organization with his retirement on November 30. Dr. and Mrs. Orr were honoured by the board and staff of the League at a dinner at Fort Qu'Appelle Sanatorium. Dr. Orr was born in the Scottish Highlands, coming to Canada at the age of 14. He taught school before entering Medicine at the University of Manitoba, where he graduated in 1916.

Dr. G. D. Barnett has been appointed medical director and general superintendent, to succeed Dr. Orr. Dr. Barnett received his B.A. from the University of Saskatchewan, and his M.D. from Manitoba.

Dr. J. M. Campbell attended the 44th Clinical Congress of the American College of Surgeons in Chicago during October, and was a collaborator in a paper on "Methods of approach in the surgery of the kidney and adrenals", presented at the meeting. Dr. J. G. Noble of the department of surgery, University of Saskatchewan, presented a paper on "The production of renal tubular damage in dogs by temporary occlusion of the thoracic aorta". Professor E. M. Nanson was the co-author of the paper.

The new 63-bed addition to the Swift Current Union Hospital and the residence for nurses employed at the hospital was officially opened on November 14. The cost of the hospital extension was $229,000, while the nurses' residence was built at a cost of $276,000. The additional 63 beds will give the hospital a capacity of 177.

G. W. PEACOCK

MANITOBA

Dr. Charles H. A. Walton, E.D., M.Sc., F.R.C.P., of Winnipeg, was elected secretary-general of the International Congress of Allergists at their meeting in Paris. Dr. Walton was Canadian delegate to the congress and read a paper before the assembled allergists. This is the first time that a Canadian has been chosen for the post of secretary-general. Dr. Walton will continue to practise in Winnipeg.

Dr. A. E. Childe of Winnipeg was elected chairman of the Executive Council of the American Roentgen Ray Society at the annual meeting in Washington, D.C., of this, the oldest radiological organization in the United States.

The annual meeting of the Manitoba Division of the Canadian Medical Association held in Winnipeg, October 6-10, has been fully reported elsewhere by the editor of the *C.M.A. Journal*. Dr. Gilder was present throughout the meetings and it was a pleasure to welcome him again to Manitoba. It was also good to shake hands with the President of the Canadian Medi-

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cal Association, Dr. A. F. VanWart, and the General Secretary, Dr. A. D. Kelly.

Dr. Sam K. Kay is now associated with the Mall Medical Group in the practice of general and thoracic surgery.

Professor C. H. Best, Director of the Banting and Best Department of Medical Research, University of Toronto, gave the annual Merck Lecture in the Auditorium of the Medical Library on October 30. His subject was "A Canadian Trail of Medical Research".

Possibly as a result of Dr. Best's visit, a Manitoba Branch of the Canadian Diabetic Association has just been formed.

Dr. J. B. Ritchie of Regina was the guest speaker at the regular meeting of the Winnipeg Medical Society on November 21. The Medical History section of the Society planned the program. Dr. Ritchie's talk on the early surgeons of the North West Mounted Police was illustrated with many slides. Dr. Murray Campbell, President of the Manitoba Historical Society, thanked the speaker. ROSS MITCHELL

ONTARIO

Dr. Gordon Bates, general director of the Health League of Canada, was presented with the Pasteur Institute Medal by the French Consul-General, Monsieur Jean Beauroy, at a recent meeting of the Association France-Canada in Toronto. Dr. Bates was awarded the medal for his efforts in combating diphtheria in Canada, through the immunization program to which he gave such sustained support for many years.

The Toronto chapter of the Multiple Sclerosis Society of Canada has made a donation of $5300 for continuing research in multiple sclerosis at the University of Toronto.

The Canadian Cancer Society's Patients' Hostel near Princess Margaret Hospital, Toronto, has been opened for the accommodation of patients from outside the city who are under treatment for cancer but not ill enough to stay in hospital. The hostel has room for 58 patients. Premier Frost said at the opening that it may be possible later on to consider those who have to use this hostel as actual hospital patients from the insurance standpoint. The cost of keeping a patient in a Toronto hospital is about $17.50 a day, while it is hoped that the hostel patient will be housed for less than $5 a day.

Honorary life membership in the Ontario Public Health Association has been conferred on six public health officials. They are Dr. R. D. Defries, consultant to the School of Hygiene, University of Toronto; Dr. C. A. Harris, formerly medical officer of health, London; Dr. W. J. Deadman, former Hamilton pathologist; Dr. J. T. Phair, formerly deputy minister of health for Ontario; Dr. L. A. Pequegnat, former Toronto M.O.H.; and Dr. J. E. Davey, former Hamilton M.O.H.

Dr. A. R. J. Boyd, Toronto's medical health officer, was elected president of the association.

Professor Malcolm G. Taylor, consultant to the Ontario Hospital Services Commission, has stated that Ontario will have to build almost 800 active treatment hospital beds every year until 1976 to maintain the present ratio of beds to population. According to a Department of Economics report, the province's population in 18 years will be 9,000,000.

Dr. W. R. Harris succeeds Dr. F. P. Dewar as chairman of the medical advisory committee of the Rehabilitation Foundation for Poliomyelitics and the Orthopædically Disabled.

The Donald C. Balfour Lecture in Surgery, University of Toronto, was given by Mr. B. K. Rank, honorary plastic surgeon to the Royal Melbourne Hospital, Australia. His subject was "Cutaneous malignancy, hazards of diagnosis".

Four of Toronto's most distinguished citizens have been awarded a gold medal, the city's civic award of merit. The recipients were Dr. C. H. Best; Dr. Sigmund Samuel, philanthropist; Dr. Healey Willan, internationally known musician; and Dr. Sydney Smith, Minister of External Affairs.

Dr. J. Christophe, Department of Nutrition, School of Public Health, Harvard University, addressed the November meeting of the Physiological Society, University of Toronto, on hormonal, dietary and environmental influences on the rate of disappearance of glucose from the blood.

Because of ill-health, Mr. Arthur J. Swanson has resigned as chairman of the Ontario Hospital Services Commission. He will be succeeded by Dr. Ian Urquhart, who will leave his position as Director of Medical Services, Ontario Hydro, to take over his new post.

Dr. J. C. C. Dawson has been appointed Deputy Registrar-Treasurer of the Ontario College of Physicians and Surgeons. Since 1938, he has practised his specialty of obstetrics with the Peterborough Clinic. He was president of the Ontario Medical Association in 1956.

Dr. Russell G. Birrell, medical director for Imperial Oil, has been made chairman of the industrial medical division of the Ontario Medical Association, and Dr. E. Mastromatteo of the Ontario Department of Health's industrial hygiene division has been elected secretary.
LILLIAN A. CHASE

The Medico-Legal Society of Toronto held its Annual Dinner Meeting at Osgoode Hall, Toronto, on Wednesday, November 19, 1958, when the speaker was Dr. A. C. Singleton, professor of radiology in the University of Toronto. Dr. Singleton discussed the hazards of radiation and the relevant protective measures. He began by surveying the sources and history of radiation, noting that the volume of diagnostic radiology had increased twofold since 1954. He

enumerated the hazards and injuries arising out of use of radiation, remarking that the genetic effects had been grossly exaggerated but that early pregnancy was the most dangerous time for radiological work. He warned against unnecessary exposures as, for instance, in insurance cases or cases involving litigation, where those concerned tended to duplicate radiodiagnostic measures.

It was announced that the Medico-Legal Society would again sponsor two medico-legal courses early in 1959, one for physicians and one for lawyers.

The following officers were elected: Mr. Eric H. Silk, Q.C., president; Dr. F. P. Dewar, 1st vice-president; Mr. Justice C. D. Stewart, 2nd vice-president.

A report was submitted by the Committee on Alcoholism, and approved by the meeting, embodying suggested legislation to deal with the habitual and incorrigible abuser of alcohol.

Dr. E. Maurice Heller of Toronto was a member of the 18-man United Jewish Appeal of Toronto Study Mission which made a survey of the refugee situation overseas.

The Mission spent two weeks in Israel, which has received 170,000 refugees since 1955, and studied the health condition of newly arrived immigrants, as well as those who had been in the country for some time.

The Mission went to Israel on the invitation of the Israel Government and Jewish Agency, and returned to Toronto early in December.

QUEBEC

The second annual Lyman Duff Memorial Lecture at McGill University was delivered by Dr. Paul Dudley White on November 19. These lectures are in memory of the late Dr. Lyman Duff, dean of medicine and professor of pathology of McGill. Dr. White called for more attention by doctors to selecting "candidates" for various diseases, and for more research into the factors that predispose certain people to certain diseases. Up to now well over 90% of medical research has been directed to identification and control of the agent causing the disease, while hardly any attempts have been made to finding out why some people get the disease and others do not. It therefore follows, "why try to protect a whole population when only some 5% will get the disease? Why not find out who are susceptible and protect them?"

In heart disease a start has been made on picking out people who are likely to have heart attacks. In general, a short, muscular, broad-limbed man with a great amount of drive and a tendency to put on weight and to make his own rules of behaviour is a better candidate for a heart attack than a tall, thin man who is ruled more by his mind than his emotions. Heredity also has a part to play. The full role of animal fat in the diet and of stress in daily life has not yet been explained. Probably some physical types should avoid a high fat diet while others may actually need one. Similarly, some people should avoid stress, while others appear to thrive on it. He summarized by emphasizing that it all boils down to, "one man's meat is another man's poison . . . which we do not apply enough in medicine."

The last Hingston Memorial Lecture at St. Mary's Hospital in Montreal, in memory of the late Dr. Donald A. Hingston, a founder of the hospital, was delivered by Dr. Richard Overholt, professor of clinical surgery at Tufts University School of Medicine in Boston on November 24. He spoke on surgery in asthma and emphasized that if a patient with asthma does not respond to conventional medical treatment, one should check for the presence of a mechanical defect in the lungs, which might be corrected by surgery. Even where an emotional factor is present, it may be possible to remove the nerve tract transmitting the emotional reactions to the lungs. He also suggested that it might be "a good idea" if everybody gave up smoking cigarettes because the habit seems to be connected with so many difficulties in the human breathing apparatus.

It has long been felt in the various English-speaking hospitals of Montreal that a need exists for a camp for diabetic children in this area. Until last summer, no such camp existed and these children either were denied camping experience or had to seek it elsewhere —in the United States or in Canada west of Ottawa.

In the spring of 1958, several physicians dealing with metabolic diseases in the English-speaking hospitals of Montreal got together to form a Medical Advisory Committee which studied the ways and means to establish such a camp. In the late part of the summer it was possible to run a ten-day camp for twenty diabetic children, under the auspices of the Montreal Children's Hospital and with the co-operation of the Boy Scouts Association. The camp was held from August 18 to 28, 1958. There were both boys and girls and the ages varied between 8 and 12—with four older boys and girls admitted as counsellors-in-training. The camp was conducted on the property and with the personnel of the Boys Scouts Association at Camp Jackson Dodds, St. Alphonse de Rodriguez. The camp was financed through parents' contributions and private donations.

The experiment was extremely successful and the children who attended are very anxious to have a camp again next summer. Work is therefore under way for the coming season. It is too early to say when or how the camp will be run next summer, but the Medical Advisory Committee hopes for a longer camp period, for a larger attendance and for a wider age range. As in the past season, any diabetic child will be eligible upon recommendation of his or her physician. Eventually, it is hoped that enough interest will be aroused in this project to stimulate a service club or some such organization into establishing the camp on a permanent site and as an independent venture.

The Junior League of Montreal Inc. has undertaken a new project this year, concerned with hæmophilia. To launch this project they put up an exhibit on November 17, in the Ritz Carlton Hotel, to which the medical profession and others were invited. It was officially opened by the Honourable Sarto Fournier, Mayor of Montreal. The exhibit had been approved by the Medical and Scientific Advisory Board of the Canadian Hæmophilia Society, and the Chairman of the Public Relations Committee, Quebec Division of the Canadian Medical Association. The

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exhibit was primarily planned for the benefit of doctors, interns, medical students, technicians, physiotherapists, hospital administrators and social workers.

I am happy to report that Dr. R. L. DuBerger of Sherbrooke, P.Q., at present Governor for District No. 6 of the College of Physicians, P.Q., will from time to time make available information of general interest to our profession on matters dealt with by the College of Physicians and Surgeons of the Province of Quebec. His first report follows:

The college held its elections last August. Out of 18 former Governors, 14 were returned, nine by acclamation; one was defeated and the other three did not come up for re-election. Drs. Donald Fleming and W. Bonin will again represent McGill and the University of Montreal respectively, while Dr. J.-B. Jobin will sit for Laval. The election of officers was held at the first general meeting on September 24. Dr. Marc Trudel of Shawinigan was re-elected president and Dr. Vance Ward of Montreal will again be first vice-president. Second vice-president is Dr. Arthur Fafard of Levis and third vice-president is Dr. Georges Lachaine of Montreal. Dr. Jean Paquin is again the registrar.

The committees were chosen and Dr. Roméo Boucher was reappointed Director of Public Relations. Dr. R. L. DuBerger was named again to represent the College at the C.M.A., Quebec Division. At an executive meeting on October 14, Dr. Georges Lachaine was chosen as substitute. Numerous motions were discussed and adopted. Dr. Archambault asked that additional representation on the Board of Governors for Montreal be again considered in view of the fact that, although having 50% of the medical population, the city is represented by only five governors out of 18. The motion was referred to the Committee on Legislation.

Dr. Rioux suggested that all associations and medical societies planning meetings should inform the Registrar of the contemplated dates; in this way, conflicting dates could be avoided. Two motions were adopted and will be acted upon. One is to ask the Federal Government to exempt from excise duties surgical and medical instruments purchased by physicians for the sole use of their practice. The other asks that the Provincial Minister of Finance grant to the medical profession the same privileges as the Federal Government in regard to retirement savings plans and income tax.

Dr. Gagnon moved that the Executive Committee be increased by one member, so that it may be more effective in its work and relieve the Registrar of some of the responsibilities he has had to assume in the past which really were the duty of the Executive. Dr. Gagnon suggested monthly meetings of the Executive, at which medical associations and individual physicians could present their viewpoints on various topics pertaining to our profession. This motion met with much support. However, some doubt was expressed as to our legal power to do so and the motion was tabled, pending legal opinion.

The President made two important announcements. Drs. J. E. Pelletier of Quebec and Gerald Lasalle of Montreal were given the task of preparing a complete plan for hospitalization and health insurance; they were assigned this duty last spring and their plan should be ready for study and approval shortly. The draft of the Medical Act as amended during the last three years is now almost ready for distribution among the Governors. It will be studied again and, in view of some opinions expressed among the profession, some further changes may be made before it is finally presented to the Provincial Legislature, probably next year.

A. H. NEUFELD

NEW BRUNSWICK

The Moncton Medical Society at their October meeting was privileged to have as their speaker Dr. B. K. Rank, C.M.G., of Melbourne, Australia. Dr. Rank was the 1958 Sims Commonwealth Travelling Professor and was the guest speaker in surgery at the Refresher Course at Dalhousie University.

An unusually alarming fire involving buildings on both sides of Main Street in Saint John, N.B., in late October provided evidence that, as usual, in catastrophe community effort is spontaneous; in this case, expert work by the city's Fire and Police Departments was backed up by many citizens. Of these, Mr. George Chittick, a construction contractor, gave such outstanding help by his personal direction of his own cranes and tackle in removing the burning timbers of a collapsed tenement which had trapped four firemen that the city council bestowed the honour of a Freeman of Saint John on him—an honour which is rarely granted. One fire captain was killed, but a lieutenant was rescued after four hours' imprisonment. During this long period, Dr. Bruce Parlee and Dr. Richard Snow repeatedly entered the very confined space to provide oxygen and medication to the trapped fireman.

The association of Mr. Chittick in this news item needs no apology, for he was a life-saver and he had for long enjoyed a very real friendship with many of the physicians in Saint John.

Dr. Ronald V. Christie, professor of medicine at McGill University, was the speaker at the October meeting of the Saint John Medical Society. He discussed bronchitis and its complications. Dr. Frank Wanamaker was chairman. In the afternoon, Dr. Christie conducted medical ward rounds in the General Hospital with Dr. A. L. Donovan, the hospital's chief physician.

Dr. Frank A. Dunsworth, associate professor of psychiatry at Dalhousie University, was the speaker at the meeting of the Mental Health Association, Saint John Branch, on October 27. His subject was: "The emotional development of the child—what to look for".

Dr. E. O'Rafferty has been appointed district medical health officer for Queens and Sunbury counties. His office is in Sussex.

Dr. Paul Barte has joined the staff of the Perth Medical Clinic. He is a graduate of the University of Queensland, and his internship was taken in the Brisbane General Hospital and the Victoria Public Hospital in Fredericton, N.B.

Dr. Emery Legère of Moncton was elected president of the New Brunswick Progressive Conservative Association at the annual meeting in Fredericton.

The Hon. J. Waldo Monteith, Minister of National Health and Welfare, visited New Brunswick on October 17. He was accompanied by Dr. G. D. W. Cameron, Deputy Minister of Health, and Dr. G. W. Davidson, Deputy Minister of Welfare. With the Hon. J. F. McInerney, M.D., Provincial Minister of Health, this group visited several government departments and were guests at a luncheon tendered by the provincial government.

Dr. G. B. Peat of Saint John has been re-elected president of the N.B. Branch of the Boy Scout Association.

At the Annual Meeting of the Medical Council of New Brunswick, Dr. H. S. Wright of Fredericton was elected president and Dr. J. R. Nugent of Saint John was appointed registrar to succeed Dr. J. M. Barry, retired.

A. S. KIRKLAND

BOOK REVIEWS

THE PRACTICE OF NUCLEAR MEDICINE. William H. Blahd, Veterans Administration Center, Franz K. Bauer, Los Angeles County Hospital, and Benedict Cassen, University of California, Los Angeles, California. 407 pp. Illust. Charles C Thomas, Springfield, Ill.; The Ryerson Press, Toronto. 1958. $13.75.

This compact, medium-size textbook with large, clear printing on high-gloss, high-quality paper is astonishingly up-to-date and complete in its review of the medical procedures, tests and treatment using radioactive isotopes.

The reviewer feels qualified, having just recently attended the United Nations Conference on this subject, to state that one will rarely see a textbook in medicine containing such current information on a subject. Obviously the authors are not only experts in their field but are also well aware of all the current literature dealing with nuclear medicine.

As a practitioner and student of pure clinical medicine, one would draw particular attention to the first section of the book dealing with the physical aspects of radioisotopes. One has never seen this subject so completely and so simply presented, and there is no doubt that undergraduates and graduates of medicine will find this section alone worth the full value of the book. In concise but most clear terms, the essentials of atomic behaviour and radioactive emissions are set forth so that without poring over chemistry and mathematics long since forgotten or usually never learned, the practising physicians can easily relate the fundamental physical and chemical properties of the radioactive isotopes with their expected biologic and clinical behaviour.

Part two, dealing with diagnostic methods, is equally clear, simple and comprehensive. This not only includes all of the diagnostic tests which are currently of proved clinical value, but the methods of doing these tests are so clearly defined that the book can replace an instructor for the techniques, and make accurate interpretation of the results of the test possible, even for those using the test for the first time. It is worth re-emphasizing that the dose of isotope to be used, its method of application, the routine for its study and the clinical interpretation of the results, are in every case fully but concisely detailed. Practically all the clinical tests with radioactive isotopes are herein included, ranging from the well-established tests on thyroid function through the newer biliary secretion test, circulatory dynamic studies, and, as well, the newer and expanding art of obtaining regional localizations with the scanning scintillation counter. Interesting in this regard, one finds the methods for scanning of brain tumours, eye tumours, surface skin tumours and even localization of obstructive lesions in the spinal cord area by performing scanning scintillography after the injection of an innocuous (small) dose of an isotope in a little saline into the spinal fluid by ordinary lumbar puncture.

Part three deals with therapeutic applications; again one can say that practically all currently accepted forms of radioisotope therapy are here concisely detailed.

The bibliography at the end of each section is not overwhelming but indicates that the authors have picked out with care articles suitable for supplementary reading. Only isotopologists who are doing fundamental research in this line will find much need to refer to sources other than this book.

The index is similarly concise but complete. One can summarize this by again saying that the book is outstandingly complete and remarkably clear and concise; the fundamental physical and chemical processes so necessary to our understanding of this specialty but so difficult for most medical practitioners to understand are made extremely simple in this textbook. It cannot be too highly recommended, and every academy, library and every institution containing a radioactive isotope laboratory would do well to procure a copy. We would like to suggest that in this atomic age all medical practitioners should at least look through this book once, if not obtain it, so that they may have an appreciation of the tests available to them.

RADIOACTIVE ISOTOPES IN CLINICAL PRACTICE. Edith H. Quimby, Sergei Feitelberg and Solomon Silver, Columbia University, New York. 451 pp. Illust. Lea & Febiger, Philadelphia; The Macmillan Company of Canada Limited, Toronto, 1958. $10.00.

This text is a most welcome addition to the libraries of all medical institutions, and of particular value to those expanding in the study and practice of nuclear medicine.

Like another textbook on this subject just published, it is divided into three parts: (1) basic physics by Edith Quimby; (2) instrumentation and laboratory methods by Sergei Feitelberg; (3) clinical applications by Solomon Silver.

It is a most complete and detailed textbook on the entire subject including the basic principles of nuclear medicine, and certainly no author is more qualified than Dr. Quimby to present the fundamental physical and chemical aspects of the subject. In most cases the basic physics is abstracted to its fundamentals and therefore easily read and understood by the medical practitioner. This section does however contain a great deal of the fundamentals which are more obscure to those who graduated from medicine more than a decade ago, and therefore one has to search out the simpler conclusions necessary for our understanding of the clearly medical aspects of isotopology. This would not consist of an objection to the greater

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detail presented on the fundamentals, which must of course be ultimately understood by physicians who are going to make this a specialty. Portions of this section are more concisely presented than one has seen anywhere; for example, Chapter 5 on nuclear fission is particularly recommended, for, within four pages, one can attain clear understanding of fission products, nuclear chain reaction, atomic pile or nuclear reactor, isotope production in the pile and nuclear weapons. These few pages alone, if read at the very beginning, will interest those physicians most remote from this specialty. In fact, one would recommend to even the layman, the reading of Chapter 5, and in one-half hour most physicians will find themselves with knowledge they could never obtain without labouring through tedious and complicated advanced nuclear physics and chemistry. Chapter 8, dealing with dosage calculation for radioactive isotopes, is a most excellent and detailed presentation, and while of essentially great importance for the specialist, is rather tough going for the doctor running a limited radioactive isotope clinic in hospitals.

One could say the same about all the chapters in parts 1 and 2, but it should be clearly pointed out that there is no other reference textbook on this subject which so completely and currently covers the subjects discussed. The chapters on radiation hazards and their avoidance, and disposal of radioactive waste, are excellent examples of the complete coverage of very important things which handlers and physicians in isotope-containing institutions should know.

Part three, dealing with the clinical application, is as complete and detailed as one can obtain. Here again each test and treatment is completely covered.

This textbook is remarkably up to date and compares most favourably in this respect with what one hears presented at even the most recent meetings of specialists in radioisotopology.

The bibliography for each section and even for separate chapters is more complete than in other books of this type.

The authors are perhaps inclined to express conclusively their opinion about the value or otherwise of certain tests with radioisotopes, and in some cases might prejudice the reader against the use of certain tests described. Since this is a rapidly advancing and enlarging science and specialty in medicine, there must necessarily be almost daily changes in our conclusions. One would therefore not necessarily agree with their conclusions regarding the greater or lesser value of certain tests to which they refer.

This is a most comprehensive and extremely detailed textbook on the subject, and its greater value would be to complement, rather than to replace, another recently published similar textbook. It is however a necessary addition to the library of institutions handling radioisotopes, most particularly for the use of those physicians involved in laboratories doing research or studying improvements on the tests currently in use.

THE ESOPHAGUS. MEDICAL AND SURGICAL MANAGEMENT. Edward B. Benedict and George L. Nardi, Harvard Medical School, Boston, Mass. 390 pp. Illust. Little, Brown & Company, Boston; J. B. Lippincott Company, Montreal, 1958. $15.00.

Although the main function of the œsophagus is that of a conduit, there is now a large and growing bibliography devoted to œsophageal disorders. The authors of the work under review have tried to put into one compact volume the essential knowledge which can be gleaned from this field of varied and sometimes bewildering medical writings. They have buttressed their theories and judgments with their clinical experiences. These experiences were mostly at the Massachusetts General Hospital, and there are few extravagant claims or speculations.

The format of the book is attractive. A paper of a dependable quality has been used, the text is readable and free from ambiguity, the paragraphing uncrowded and the figures—mostly skiagrams and more than one hundred in number—are of consistent clarity. In addition, there are 16 colour plates. As a result the price is high for such a small volume, although it probably is not greatly beyond that which is inherent in similar non-medical publications.

Aside from the possible drawback of its cost, the work can be unreservedly recommended—especially to the general practitioner. It can be resorted to with the confidence that it will furnish succinct, reliable and practically complete information when the signs or symptoms raise the suspicion that the œsophagus has something to do with the clinical picture.

CLINICAL OBSTETRICS AND GYNECOLOGY: Vol. 1, No. 2. Fibromyomas of the Uterus: edited by R. A. Kimbrough. Toxemias of Pregnancy: edited by L. M. Hellman. 249 pp. Illust. Paul B. Hoeber, Inc., Medical Book Department of Harper & Brothers, New York, 1958. $18.00 per vol.

The avowed intent of this series was stated in the preface of the first issue: "To be a continuing source of information on the procedures used by experts in leading centres in the actual care of patients". It is designed for active, busy practitioners, mainly specialists, but it will interest the general practitioner.

The high standard of the first is maintained in the second issue, devoted in its obstetrical half to toxæmias of pregnancy and in its gynæcological half to fibromyomas of the uterus. Dr. Louis Hellman has edited the chapters on toxæmias of pregnancy — surely a modest and self-effacing task of editing in that it includes no article by himself.

There are three basic articles on fluid and electrolyte balance and sodium excretion in toxæmia of pregnancy. In these three articles Roy W. Bonsnes, Joseph Seitchik and Leon C. Chesley make a difficult subject easy, in keeping with the high standard of these authors. Then follow three articles on the vascular changes in toxæmia. The brilliant research work of J. C. McClure Browne is described, but the highlight of these three is a simple, limpid article by Milton L. McCall describing his work on the cerebral circulation in toxæmia of pregnancy. Having read this, the reader knows which hypotensive drug to use—and why.

R. H. J. Hamlin's article describing his impressive work on the prophylaxis of toxæmia of pregnancy by an intensified prenatal care program is remarkable for its shift of emphasis on to diagnosis of toxæmia of pregnancy in the second trimester on the basis of weight gain alone, and its *treatment* at this stage. This is an advance in thinking, and surely with it should go an inclusion of excessive weight gain as a definitive sign of toxæmia with a possible corresponding exclusion of albuminuria as *too late a sign.*

(Continued on page 70)

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In contradistinction to this, N. S. Assali's article on the treatment of acute toxæmia is disappointing, including as it does an impossibly regimented and rigid scheme of treatment. The article by David M. Kydd on renal disease and hypertension is not helpful to the practising obstetrician.

Robert A. Kimbrough has edited the second half of the issue on fibromyomas of the uterus. His excellent review of general considerations in their treatment is so concisely and comprehensively written that the other authors are able to do a good job of elaboration. Thus there may be repetition, but this is never dull.

Operative techniques are carefully described by Richard W. Te Linde, Virgil S. Counseller and Eugene Edwards. The vaginal approach occasionally comes close to surgical gymnastics. John B. Montgomery starts off with a forlorn defence of radiation therapy for myomas but stresses the danger of subsequent uterine and pelvic malignancy and ends with the statement that radiotherapy should be limited to patients who are poor risks and whose life expectancy is somewhat limited.

This is an excellent series and should be supported by practising and teaching obstetricians and gynæcologists. All the contributions are carefully chosen and nearly all the articles repay careful study.

WORLD HEALTH. Fraser Brockington, Professor of Social and Preventive Medicine, Manchester University. 405 pp. Penguin Books Inc., Baltimore, Md., 1958. $0.95.

Although the Pelican series is primarily intended for the enquiring layman, some of these volumes dealing with medical themes are very valuable for the physician. The latest one, "World Health", is particularly suitable in this respect, giving a lucid and comprehensive account of the problems facing the world in striving for the objective of better health. Reading it is an antidote for complacency, and gives a rather sobering glimpse of the vast amount of public health work still needed to bring this world's inhabitants into anything like a reasonable standard of fitness.

Professor Brockington writes well and persuasively, and manages to make even health statistics sound dramatic. He outlines the factors—geographic, political, cultural, etc.—involved in the pursuit of health, traces the earlier national efforts at a public health program, pointing out the two fundamental systems of local autonomy and rigid centralization, and then deals with the international health movements, culminating in the work of WHO.

The clinician will be somewhat disturbed at the assumption that a state public health system is going to absorb the whole of medical care, and that the much desired marriage of curative and preventive medicine really amounts to a rape of the former by government. This is regarded as preferable to the alternative, a hospital-centred system with its attendant evil of "disease-mindedness".

This book is recommended to all practitioners concerned with the future pattern of medicine as an exposition of the world health system by a brilliant and much-travelled English physician and social scientist.

ABSTRACTS *from current literature*

MEDICINE

Tuberculin Skin Reaction in Active Pulmonary Tuberculosis.

C. F. LESTER AND R. J. ATWELL: *Am. Rev. Tuberc.*, 78: 399, 1958.

One thousand patients admitted consecutively to a large tuberculosis hospital were skin-tested with commercial PPD. Of this number, 624 had evidence of pulmonary lesions roentgenographically and had at least one specimen of sputum or gastric washings positive for tubercle bacilli on culture. Of these proved tuberculous patients, 21.7% failed to develop reactions to first-strength PPD (0.00002 mg.) and 8.7% failed to react to intermediate-strength PPD. Four patients initially revealed complete anergy to second-strength PPD and OT, 1:100, but became reactors with improvement in their disease. These data indicate to the authors the need for continued use of higher doses of tuberculin in diagnosis of pulmonary lesions.

S. J. SHANE

Some Cardiovascular Effects of Reserpine.

M. D. YABLONSKI *et al.*: *Am. J. M. Sc.*, 235: 639, 1958.

Twelve patients, 11 of whom had no appreciable peripheral vascular abnormalities, were studied by intramuscular injection of 2.5 mg. of reserpine. The series included five normotensives and seven hypertensives. The studies were carried out in a temperature-controlled room under reproducible circumstances. Patients were brought fasting to the laboratory on the first day for control studies, and recalled on the second day for repetition of the studies four hours after the injection of reserpine.

Reserpine significantly increased digital blood flow in both normotensive and hypertensive patients. A fall in mean blood pressure and peripheral resistance was observed in each case with variable changes in pulse rate. No side effects were observed. S. J. SHANE

Determination of Bilateral Residual Volume. II. Examinations in Cases of Pulmonary Tuberculosis.

E. ORINIUS AND I. STAHLE: *Am. Rev. Tuberc.*, 78: 376, 1958.

The helium-dilution method was used in connection with bronchospirometry to determine bilateral functional residual capacity in 48 patients with pulmonary tuberculosis. Certain factors were found to be of importance for increase of the ratio of residual volume to total lung capacity in pulmonary tuberculosis. These were: an extension of the lung process over more than one lobe; earlier collapse treatment; extensive pleural thickening; emphysema; and a duration of disease for over one year. Presence of more than one of these factors nearly always increases this ratio significantly.

In preoperative and postoperative studies of lung function, no definite statements can be made solely on the basis of spirometric examination of functional residual capacity concerning the distribution of this ratio between the lungs. For complete assessment of lung function, bilateral determination of functional residual capacity is necessary. S. J. SHANE

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CONNAUGHT

HEPARIN

Heparin is recognized as a blood-anticoagulant having a prompt effect and a wide margin of safety. In the event of overdose or bleeding, the effect of heparin can be rapidly neutralized by intravenous administration of protamine sulphate or whole blood. Clotting times may be determined quickly at low cost.

Use of heparin has been a matter of investigation in coronary atherosclerotic patients with impending myocardial infarction. Doses of about 15,000 units were administered subcutaneously every 12 hours for a period of one or two weeks before commencing treatment with oral anticoagulants. In patients with myocardial infarction, treatment with heparin was prescribed during the first three weeks. After good symptomatic response had been established use of oral anticoagulants was commenced supplemented by approximately 20,000 units of heparin two or three times weekly for two or three months.

Summaries of treatment of deep venous thrombosis and pulmonary embolism show the use of unmodified heparin preparations in amounts of about 20,000 units daily for from six to ten days. It has been anticipated that heparin would lessen the extent of venous block in leg veins and reduce clot propagation in pelvic veins. Heparin should also lessen propagation of thrombi already lodged in the pulmonary arterial tree.

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RECENT REFERENCES

Engelberg, H., Simplified Heparin Therapy of Impending and Acute Myocardial Infarction, Ann. Int. Med., **44**, 466, 1956.

Crane, C., Deep Venous Thrombosis and Pulmonary Embolism, New Eng. J. Med., **257**, 147, 1957.

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(Continued from page 70)

Effect of Prolonged Administration of Rauwolfia Serpentina (Raudixin) on Gastric Acidity.

D. BERKOWITZ: *Am. J. M. Sc.*, 235: 657, 1958.

In several recent studies with reserpine, reactivation of a chronic peptic ulcer has been noted with resulting pain, hæmatemesis or melæna. This complication has not been reported where the whole-root preparation was given. The present study was undertaken because of the lack of data dealing with the effects of prolonged administration of the whole root on gastric acidity.

A whole-root preparation of *Rauwolfia serpentina* was administered to 25 patients in doses of 100 to 300 mg. daily for periods ranging from six months to more than a year. There were no signs of activation of acute or chronic peptic ulcer in any of those treated.

Gastric analyses before and during drug therapy showed no evidence of gastric stimulation. The authors consider that whole-root preparations of Rauwolfia in doses up to 300 mg. daily may be prescribed over long periods, even when there is a history of ulcer, without fear of causing ulcer. S. J. SHANE

SURGERY

Peptic Œsophagitis Simulating Postcholecystectomy Syndrome.

A. I. FRIEDMAN: *Ann. Int. Med.*, 49: 120, 1958.

Cholecystectomy was performed for cholelithiasis in four patients, without relief of symptoms. In one patient, subsequent sphincterotomy for a presumptive diagnosis of biliary dyskinesia also failed to relieve the symptoms. Gastroenterologic examination from one to eight years later revealed a sliding hiatus hernia with peptic œsophagitis. Medical treatment produced symptomatic relief in three patients, and one required surgical intervention for repair of the hernia.

The "postcholecystectomy syndrome" is in some instances a result of inadequate preoperative investigation. Peptic œsophagitis may be responsible for the symptoms of a patient with calculous disease of the gall-bladder whenever heartburn and sour regurgitation are prominent in the clinical picture. In these patients the authors feel that the decision to operate for gall-bladder disease should be delayed until barium-meal study. The high incidence of silent, calculous gall-bladder makes such clinical investigation mandatory to avoid some of the failures of gall-bladder surgery. S. J. SHANE

Combined Abdominoendorectal Resection for Lesions of the Mid and Upper Parts of the Rectum.

E. M. BLACK AND R. J. BOTHAM: *A.M.A. Arch. Surg.*, 76: 688, 1958.

For carcinoma of the rectum, an operation of the pull-through type that differs from the usual sphincter-saving technique in that 3 to 4 cm. of rectum is preserved is advocated in order to improve fæcal control. It has been done for carcinoma, benign polypoid lesions, megacolon and segmental ulcerative colitis.

After mobilizing the colon and ligating the bowel below the lesion, the full thickness of the rectal wall is severed 3 cm. above the dentate margin, the sphincter dilated, and the colon pulled through the distal stump. Appendices epiploicæ are sutured to perianal skin to prevent retraction and the colon is cut off outside the anus. Two weeks later, union between the rectal stump and colon may be found secure and removal of the redundant bowel may be completed. Some stenosis occurs at the level of union during the next few months, and finger dilatations may be indicated.

Occasionally sloughing of the colon is a complication which may extend above the rectal stump and lead to fæcal abscesses. Care in determining where the inferior mesenteric artery should be ligated is usually sufficient to avoid this. Pelvic abscess may result from the collection of serum in the presacral hollow, but is usually avoided by the use of a catheter with suction as a perineal drain. Retraction of the colon to above the cut end of the rectum may result in failure of union between the two, and secondary suture may be necessary. Abdominal colostomies are occasionally necessary to treat complications. One hospital death in 114 operations was due to pulmonary embolism, and there were four other deaths, so that this lesser operation had about the same mortality as abdominoperineal resections at the Mayo Clinic. BURNS PLEWES

Mucosal Folds at the Cardia as a Component of the Gastro-œsophageal Closing Mechanism.

G. S. MULLER BOTHA: *Brit. J. Surg.*, 45: 569, 1958.

For two hundred years, there has been dispute regarding the closing mechanism at the gastro-œsophageal junction. Specimens from the autopsy table proved unsatisfactory in many cases, but examination of the region through the proximal end of the open stomach during gastrectomy demonstrated the reality of mucosal folds, of physiological importance but varying in their anatomy, which closed the œsophageal orifice. The mucosal-fold pattern about the junction was also studied in 21 different species by dissection; in such animals as the tortoise, rat, dog, bat, rabbit, monkey, and pig there were similar but varying arrangements of the gastric mucosa at the orifice. Experiments on animals under light anæsthesia with the stomach widely open through a thoraco-abdominal incision to show activity, with different stimuli of the œsophageal orifice, revealed a great difference from anatomical specimens. Recorded by 16-mm. cinematography, sometimes by slow-motion film, the movement of mucosal folds in this region was found to be real and often rapid. Obliteration of the cardio-œsophageal angle, excision of the diaphragm and other alterations did not prevent closure of the orifice by mucosal folds in the dog for instance. Radiological and histological observations were also made.

Arguing from many observations, it is concluded that the mucosal folds and the internal sphincter of the distal œsophagus act together to form the watertight closing mechanism between the stomach and the œsophagus. The defect in this mechanism which follows weakening of the crura of the diaphragm and hiatus herniation leads to reflux of gastric contents. The diaphragm has nothing to do with the normal closing mechanism, except to maintain normal anatomy. Thus near-total gastrectomy does not destroy the normal closure, and often normal closure is present when part of the stomach is above the diaphragm.

Closure of the gastro-œsophageal junction is not by a mechanical valve but by mucosal folds moved by an active muscularis mucosæ, and thus is not demonstrable in anatomical or autopsy-room dissections.

BURNS PLEWES

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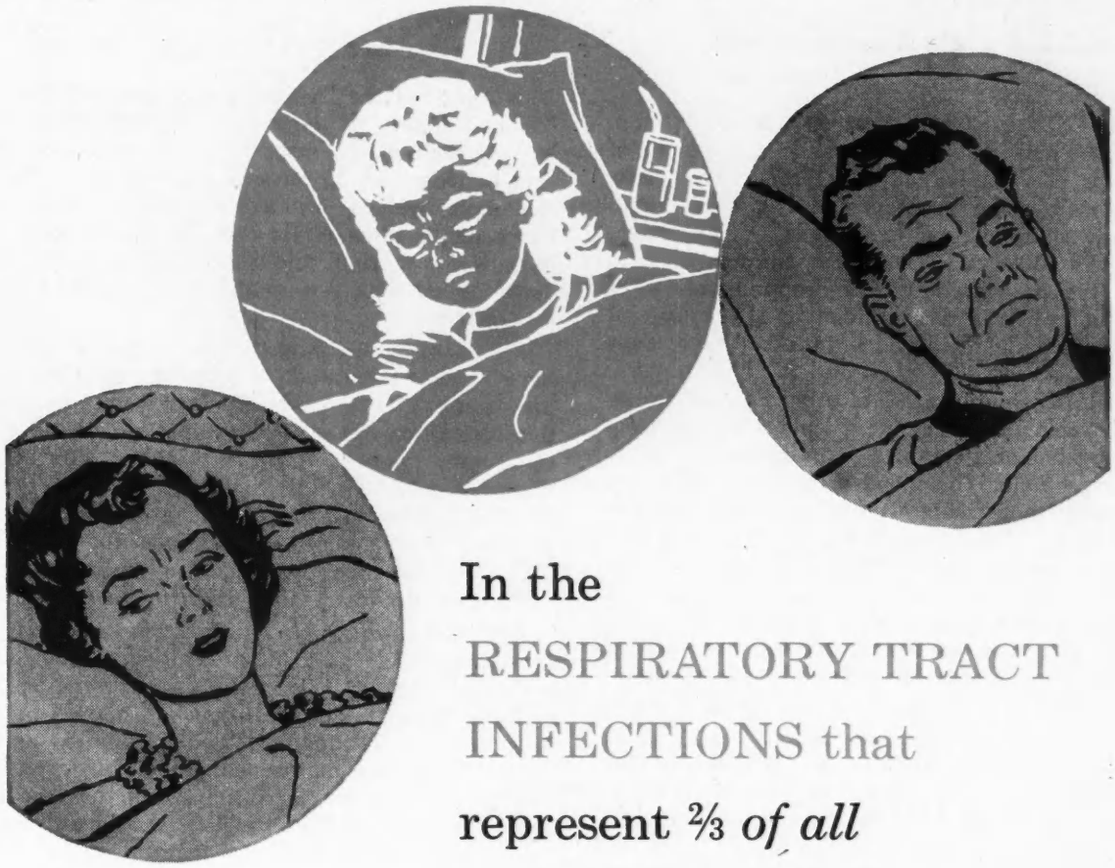

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1. Dingle, J. H. and others: Am. J. Hyg. 58:16 (July) 1953.

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(Continued from page 72)

THERAPEUTICS

Renal Failure due to Para-aminosalicylic Acid.

DIANA OWEN: *Brit. M. J.*, 2: 483, 1958.

A 31-year-old patient developed fever (temp. 101.6° F.), a pink macular rash, and enlargement of the posterior cervical lymph nodes some five weeks after being started on streptomycin, 1 g. three times a week, daily sodium para-aminosalicylate (PAS) 12 g., and isoniazid 300 mg. The temperature rose to 103.2° F. the next evening and dropped only after all other therapy was discontinued and a course of diphenhydramine hydrochloride started. Three days later the temperature rose again and the diphenhydramine was also discontinued. The urine became scanty and highly coloured, contained leukocytes, erythrocytes, and hyaline and granular casts, and was strongly positive for albumin. The blood urea rose to 150 mg. and eventually to 245 mg./100 ml. on the 17th day of acute illness. Three days later, fluid balance was re-established and in another 10 days the urine showed great improvement although glycosuria persisted. Test doses of the various drugs used by this patient proved conclusively that PAS was responsible for this reaction, as it reproduced a similar skin rash and water retention lasting 48 hours after oral administration of 4 g. of the drug.

In the discussion of reactions to PAS, the author states that this is probably the first case reported in which this drug caused renal failure without hepatitis. As this is a rare complication, there seems to be no reason to restrict the use of this drug. Whether calcium B-PAS would be safer than PAS or sodium PAS is questioned by the author. W. GROBIN

A Study of Radiation Therapy in Carcinoma of the Pancreas.

J. S. BILLINGSLEY, L. G. BARTHOLOMEW AND D. S. CHILDS, JR.: *Proc. Staff Meet. Mayo Clin.*, 33: 426, 1958.

In 1955 at the Mayo Clinic the diagnosis of carcinoma of the pancreas was made and confirmed histologically in 64 cases. This does not include islet cell tumours or those cases in which the diagnosis of pancreatic tumour was made clinically but not confirmed by histologic examination. Of these patients 52 had no radical operation, and their survival after various forms of therapy is the subject of this study. Six of the patients who had previously received palliative surgical treatment and seven of those who only had a biopsy performed were given radiation therapy. All but one of them were treated with a cobalt teletherapy unit, a conventional 250-kV. having been used on the one exception. The survival time of this group showed little difference from that of the other groups, and there was no greater relief from pain nor was there any better prevention of formation of fluid achieved by radiation therapy.

The criteria for selection of potential candidates for palliative high-dose radiation therapy, which may offer some benefit, are that the patient should be in good general condition and able to withstand this intensive treatment. Furthermore, the tumour should be localized to the immediate area of the pancreas without evidence of distant metastases. W. GROBIN

INDUSTRIAL MEDICINE

The Role of the Physician in Motor Vehicle Accident Prevention.

H. BRANDALEONE: *Indust. Med.*, 27: 487, 1958.

This report of the Committee on Standards for Motor Vehicle Drivers, of the Industrial Medical Association, stresses the need for research to determine the relationship between certain physical and emotional problems, and motor vehicle accident causation. The physician has a significant role. He must be critical in certifying persons for driving, and should in every way try to convince patients not qualified to drive to give up this privilege.

For many years industry and industrial physicians have been interested in motor vehicle accident prevention. The Industrial Medical Association through this committee has made an important contribution to the understanding of this problem. Its "Recommendations for Medical Standards for Motor Vehicle Drivers", published recently, prescribes the basic physical and mental qualifications for drivers and makes recommendations regarding the type and frequency of physical examinations to be performed.

Attention is drawn to the following medical factors in motor vehicle accident prevention: organic disease (physical factors), psychological factors, and drug factors. Although statistical data are needed, it should be possible to formulate a medical opinion as to the potential dangers of various pathological states. For example, a diabetic on insulin, who has insulin reactions, should not drive; neither should a person who has a neurological condition that might be suddenly incapacitating. The psychological factors involved in accidents are significant, but at present there are no satisfactory practical psychological tests. Consideration must be given also to the possible deleterious effect upon driving ability resulting from the use of alcohol or drugs such as antihistamines and tranquillizers.

The physician should also encourage the improvement of methods in policing and reporting accidents by law enforcement agencies. He should advocate driver education of adults and high school students, and more rigid examination for licensing of drivers, and should advise the automotive engineer and the automobile manufacturer to stress safety in automobile design. MARGARET H. WILTON

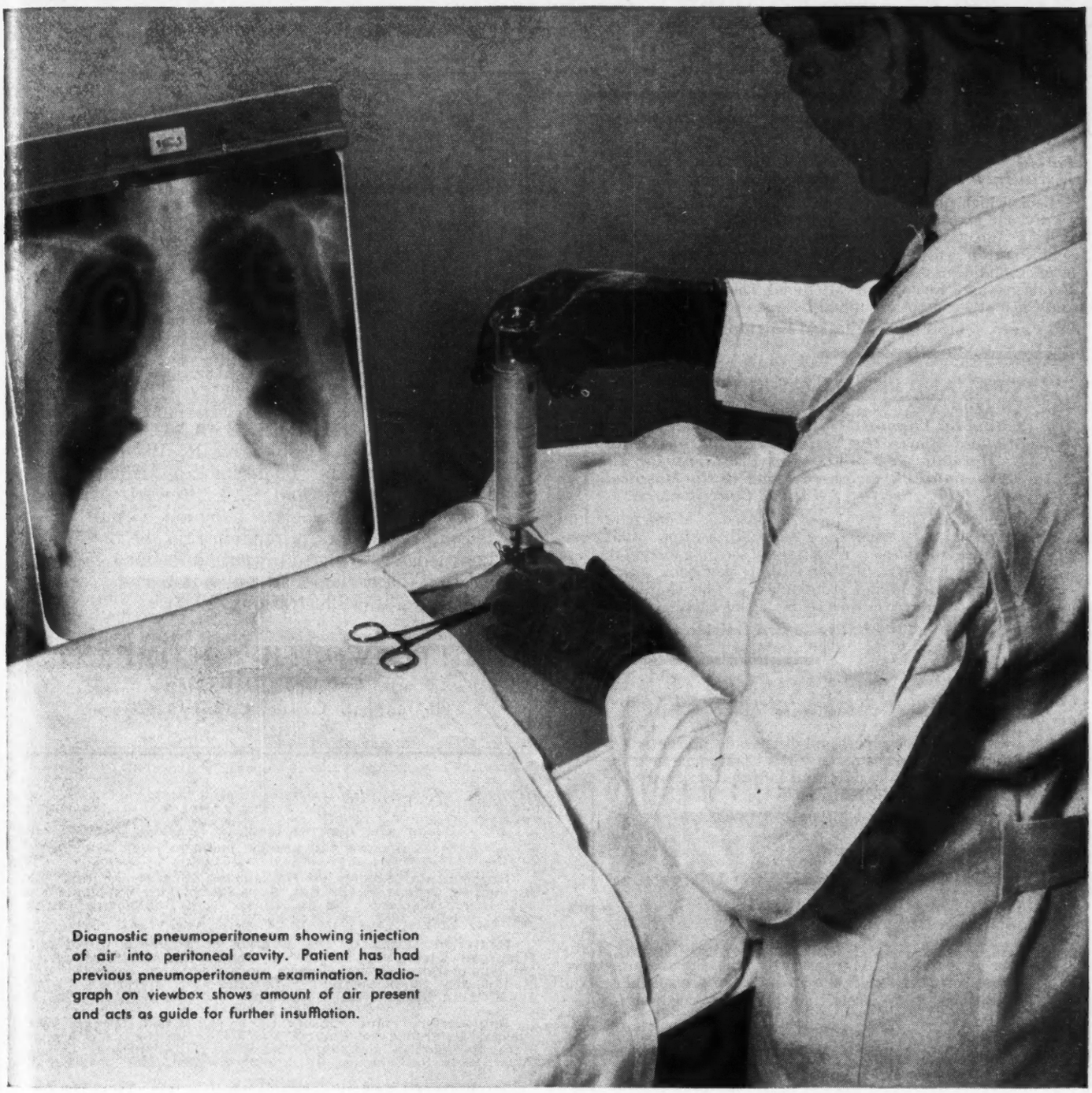
FORTHCOMING MEETINGS

CANADA

CANADIAN SOCIETY FOR CLINICAL INVESTIGATION, Annual Meeting, Vancouver, B.C. (Dr. John Gemmell, University of Manitoba, Winnipeg, Secretary-Treasurer.) January 22, 1959.

ROYAL COLLEGE OF PHYSICIANS AND SURGEONS OF CANADA, Annual Meeting, Vancouver, B.C. (The Secretary, 150 Metcalfe St., Ottawa 4, Ont.) January 23 and 24, 1959.

COLLEGE OF GENERAL PRACTICE (ALBERTA CHAPTER), AND SECTION OF GENERAL PRACTICE, CANADIAN MEDICAL ASSOCIATION (Alberta Division), Fifth Annual Meeting, Banff, Alta. (Dr. A. A. Gorman, Secretary-Treasurer, 8211-107th St., Edmonton, Alta.) January 28-30, 1959.



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Books Received

Books are acknowledged as received, but in some cases reviews will also be made in later issues.

Experimental Studies on Radioactive Zinc in the Male Reproductive Organs of the Rat. Acta Radiologica Supplementum 156. Bengt Wetterdal. 82 pp. Illust. Acta Radiologica, Stockholm, Sweden, 1958. Sw. Kr. 30.

Radiation Doses to the Gonads of Patients in Swedish Roentgen Diagnosis. Studies on Magnitude and Variation of the Gonad Doses Together with Dose Reducing Measures. Acta Radiologica Supplementum 157. Lars-Eric Marsson. 127 pp. Illust. Acta Radiologica, Stockholm, Sweden, 1958. Sw. Kr. 30.

Angiocardiographic Observations in Mitral Disease with Special Reference to Volume Variations in the Left Atrium. Acta Radiologica Supplementum 158. H. Arvidsson. 123 pp. Illust. Acta Radiologica, Stockholm, Sweden, 1958. Sw. Kr. 30.

Percutaneous Selective Angiography of the Cœliac Artery. Acta Radiologica Supplementum 159. P. Odman. 168 pp. Illust. Acta Radiologica, Stockholm, Sweden, 1958. Sw. Kr. 35.

Mental Health Aspects of the Peaceful Uses of Atomic Energy. Report of a Study Group. World Health Organization Technical Report Series No. 151. 53 pp. World Health Organization, Geneva, 1958. $0.60.

Studies on the Effect of Thyrotropic Hormone on the Thyroid Function in Man. Acta Radiologica Supplementum 160. J. Einhorn. 107 pp. Illust. Acta Radiologica, Stockholm, Sweden, 1958. Sw. Kr. 30.

The Vascular Anatomy of Long Bones. A Radiological and Histological Study. Acta Radiologica Supplementum 161. G. Tilling. 106 pp. Illust. Acta Radiologica, Stockholm, Sweden, 1958. Sw. Kr. 25.

Renal Angiography during and after Unilateral Ureteric Occlusion. A Long-term Experimental Study in Dogs. Acta Radiologica Supplementum 162. T. Widen. 103 pp. Illust. Acta Radiologica, Stockholm, Sweden, 1958. Sw. Kr. 30.

Nephrographic Effect and Renal Arteriographic Damage. An Experimental Study. Acta Radiologica Supplementum 163. C.-G. Helander. 87 pp. Illust. Acta Radiologica, Stockholm, Sweden, 1958. Sw. Kr. 30.

Congenital Atresia of the Small Intestine. A Roentgenographic Study of 24 Cases. Acta Radiologica Supplementum 164. H. Gladnikoff. 58 pp. Illust. Acta Radiologica, Stockholm, Sweden, 1958. Sw. Kr. 25.

Coarctation of the Aorta, Aortographic Studies before and after Operation. Acta Radiologica Supplementum 165. B. Brodén and J. Karnell. 61 pp. Illust. Acta Radiologica, Stockholm, Sweden, 1958. Sw. Kr. 30.

Clinical Obstetrics and Gynecology, Vol. 1, No. 3. Symposium on Abnormal Uterine Bleeding. Edited by J. I. Brewer. **Symposium on Special Diagnostic Aids.** Edited by C. P. Hodgkinson. 852 pp. Illust. Paul B. Hoeber, Inc., Medical Book Department of Harper & Brothers, New York, 1958. $18.00 per volume.

Atlas of Technics in Surgery. John L. Madden, New York Medical College, New York. 648 pp. Illust. Appleton-Century-Crofts, Inc., New York, 1958.

Breast Cancer. The Second Biennial Louisiana Cancer Conference, New Orleans, January 22-23, 1958. Edited by Albert Segaloff. 257 pp. Illust. The C. V. Mosby Company, St. Louis, Mo., 1958. $5.00.

Lehrbuch der Strahlenheilkunde. Behandlung mit Roentgenstrahlen und Radioaktiven Substanzen. Textbook of Radiography: Treatment with x-rays and radioactive substances. R. duMesnil de Rochemont. 763 pp. Illust. Ferdinand Enke Verlag, Stuttgart, W. Germany, 1958.

Hypophysen-Schilddruesen-Erkrankungen und Endokrine Ophthalmopathie. Radiojoddiagnostik und Strahlentherapie. Pituitary-Thyroid Disorders and Endocrine Ophthalmopathics: Radioiodine Diagnosis and Radiotherapy. Wolfgang Horst and Klaus Ullerich. 141 pp. Illust. Ferdinand Enke Verlag, Stuttgart, W. Germany, 1958.

Die Gasœdeme des Menschen. Band 3, Atlas der Gasœdeme. Human Gas Gangrene. Vol. 3, Atlas of Gas Gangrene. J. Zeissler, C. Krauspe and L. Rassfeld-Sternberg. 109 pp. Illust. Dr. Dietrich Steinkopff Verlag, Darmstadt, 1958.

Peripheral Nerve Injuries. Ruth E. M. Bowden, University of London, England. 62 pp. Illust. H. K. Lewis & Co. Ltd., London, 1958. 8s. 6d. net.

Food and You. Egmund Siguard Nasset, University of Rochester, N.Y. 166 pp. Barnes & Noble, Inc., New York, 1958. $1.25.

Lifetime Health Record. David D. Rutstein, Harvard Medical School, Boston, Mass. 127 pp. Harvard University Press, Cambridge, 1958. $2.50.

Listening with the Third Ear. The Inner Experience of a Psychoanalyst. Theodor Reik. 514 pp. Grove Press Inc., New York; McClelland & Stewart Ltd., Toronto, 1948. $2.15.

Rebel without Cause. The Hypnoanalysis of a Criminal Psychopath. Robert M. Lindner. 296 pp. Grove Press Inc., New York; McClelland & Stewart Ltd., Toronto, 1944. $1.95.

The Forgotten Language. An Introduction to the Understanding of Dreams, Fairy Tales and Myths. Erich Fromm. 263 pp. Grove Press Inc., New York; McClelland & Stewart Ltd., Toronto, 1951. $1.95.

A Study of Interpersonal Relations. New Contributions to Psychiatry. Edited by Patrick Mullahy. 507 pp. Grove Press, Inc., New York; McClelland & Stewart Ltd., Toronto, 1949. $2.65.

Who Are the Guilty? A Study of Education and Crime. David Abrahamsen. 340 pp. Grove Press Inc., New York; McClelland & Stewart Ltd., Toronto, 1952. $2.15.

Psychoanalysis: Evolution and Development. Clara Thompson and Patrick Mullahy. 252 pp. Grove Press Inc., New York; McClelland & Stewart Ltd., Toronto, 1957. $1.95.

Jung's Psychology and its Social Meaning. Ira Progoff. 299 pp. Grove Press Inc., New York; McClelland & Stewart Ltd., Toronto, 1953. $2.15.

The Practical Use of the Microscope. Including Photomicrography. George Herbert Needham, University of California, San Francisco. 493 pp. Illust.; Charles C Thomas, Springfield, Ill.; The Ryerson Press, Toronto, 1958. $17.00.

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GENERAL PRACTITIONER, L.M.C.C., age 35 years, married with family; six years' experience in general practice; desires opening with group or single man or the purchase of a busy practice. Available January 1959. Reply to Box 953, Canadian Medical Association Journal, 150 St. George Street, Toronto 5, Ontario.

ANÆSTHETIST, M.D., Leyden, Holland, specialization training in Canada, eligible for certification, L.M.C.C., age 34 years, desires opening preferably with group or clinic. Willing to do general practice if required. Reply to Box 954, Canadian Medical Association Journal, 150 St. George Street, Toronto 5, Ontario.

RADIOLOGIST, age 38 years, Europe and U.S.A. trained, also neuroradiology, references, writing certification examinations fall 1959 and L.M.C.C. next May, seeks hospital position preferably in the Maritimes. Write to Box 956, Canadian Medical Association Journal, 150 St. George Street, Toronto 5, Ontario.

GENERAL PRACTITIONER, Canadian graduate 1956, married with family, desires position as an assistant, a partner or in a group practice in Ontario. Available July 1, 1959. Reply to Box 957, Canadian Medical Association Journal, 150 St. George Street, Toronto 5, Ontario.

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(Continued on page 34)

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MEDICAL NEWS *in Brief*

(Continued from page 49)

A REQUEST FROM THE R.C.M.P.

We have been asked to co-operate with the Royal Canadian Mounted Police in circulating a description of a man and a woman wanted for questioning in connection with a serious crime. Anyone who has information of the whereabouts of the persons described below is asked to communicate with the nearest detachment of the Royal Canadian Mounted Police.

Yvonne Conley, with aliases: Yvonne B. Blunt, Yvonne Broome, Starr Burk, Lee Burke, Yvonne Galipeau, Yvonne Hales, Yvonne Mason, June Noble, Doris Walker, Lee Walkers, and others. Description: age 45, born July 19, 1913, St. Pierre, Manitoba; height, 4′ 11½″; weight, 140 lb.; build, heavy; hair, brown; eyes, brown; complexion, dark; race, white; scars and marks, ½″ cut scar on forehead between eyebrows, ½″ cut scar under chin, scar on back of left hand, hysterectomy scar, numerous needle marks on hips; some upper teeth reportedly missing; has had cirrhosis of the liver.

George Edward Cole, with aliases: George E. Cole, George Edward Puckett, George Edward Cole Puckett. Description: age 31, born March 24, 1927, Philadelphia, Pennsylvania; height, 6′ 1″; weight, 160 to 178 lb.; build, medium; hair, brown, receding; eyes, brown; complexion, medium; race, white; nationality, American; occupations, bus driver, truck driver, typist; scars and marks, pit scar on outside corner of right eye, small cut scar on inside of left wrist, appendectomy scar, tattoo small heart and names "Mom" and "Dad" and letters "GP" or "SP" on left forearm, tattoo eight-point star on back of left hand; wears full upper denture.

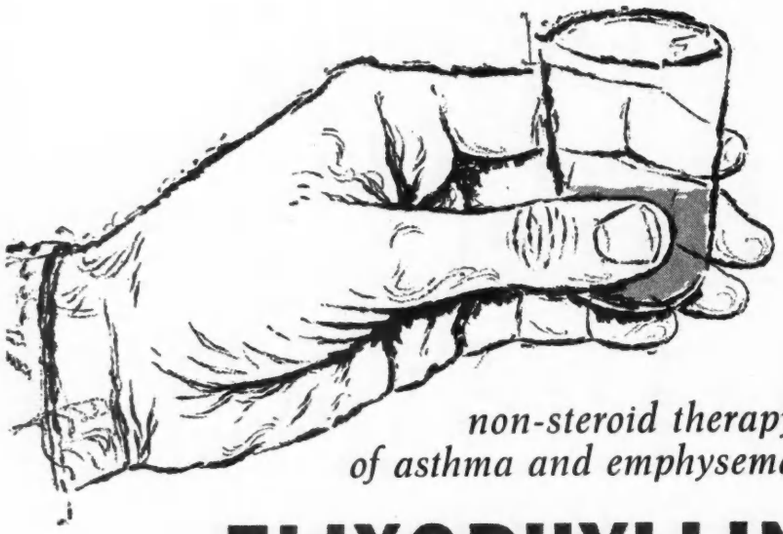
—

NEPHROTIC SYNDROME IN CARDIAC FAILURE

The nephrotic syndrome may appear as a complication of chronic heart failure as gathered from the description of four cases by Burack, Pryce and Goodwin (*Circulation*, 18: 562, 1958). Pre-existing renal disease, diabetes and amyloid deposits had been ruled out in these patients. There was no evidence of collagen disorder except that associated with the nephrotic syndrome. Mercurial toxicity was incriminated in the past as a cause of nephrosis. However, on closer look many of these so-called nephrotics may have been cases of low salt syndromes. Considering that in instances where it is related to heart failure, this renal condition is reversible, there is no contraindication to continued administration of mercurial diuretics unless there are obvious signs of mercurial toxicity such as rash, abdominal pain, gingivitis, or evidence of acute renal damage with a suddenly rising blood urea. However, one should bear in mind the tendency of mercurial diuretics in tablet form for oral administration to accumulate in the body.

The mechanism of proteinuria is often explained on the basis of tubular inability to re-absorb normally filtered protein. However, in congestive failure globulins as well as albumin are lost by the kidney and there are no serum electrolyte abnormalities or abnormal aminoaciduria. Moreover,

(Continued on page 51)



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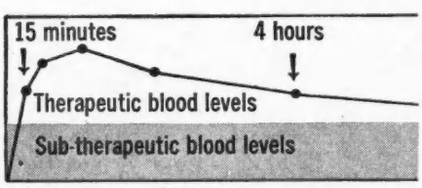

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MEDICAL NEWS *in brief*

(Continued from page 48)

the proteinuria commonly associated with heart failure shows a good correlation between the degree of proteinuria and clinical severity of the failure, yet proteinuria of the degree observed in the cases described would normally have been the result of ultimate failure. According to the authors, "the detailed chain of events that links venous congestion with proteinuria remains obscure".

VARIETIES OF HUMAN HÆMOGLOBIN D

Benzer, Ingram and Lehmann (*Nature,* 182: 852, 1958) recently reported the discovery of three varieties of human hæmoglobin *D*. Variety α was found in a Turkish Cypriot, variety β in a Gujerati Indian and variety γ came from a Sikh. The first two were mixed with hæmoglobin *A*. All varieties showed complete and ready solubility at 25° in 5 g./l. of Itano's 2.24 *M* phosphate buffer, which indicated absence of hæmoglobin S. It was ascertained by electrophoresis and ion exchange chromatography that each carried a chemical charge in a different part of the hæmoglobin molecule. As such it is claimed that they are three distinct proteins. According to the authors, "the present observation that the two hæmoglobins *D* of the Gujerati and the Sikh are the result of distinct mutations would explain the patchy distribution of hæmoglobin *D* in India".

SPONTANEOUS REGRESSION OF CANCER

If spontaneous regression of cancer be interpreted as the partial or complete disappearance of a malignant tumour in the absence of any treatment or in the presence of therapy which is considered inadequate to exert a significant influence on neoplastic disease, then, from a series from over 1000 cases reported in the literature or collected by personal communication by T. C. Everson (*Connecticut Med.,* 22: 637, 1958), only 90 have been considered sufficiently documented to be accepted as exponents of this unusual phenomenon. The clinical criteria on which observations should be based include regression of primary or metastatic tumours, regression of presumptive metastases as judged by serial radiographs, prolonged rest of a neoplastic growth or a prolonged latent period between development of a primary tumour and evidence of metastases. Among the types of malignancies which have followed this pattern were, in order of frequency: neuroblastoma, malignant melanoma, chorio-epithelioma, bladder and breast cancers. Other types of malignancies were also represented by isolated cases. Among the possible factors considered responsible for spontaneous regression of cancer were endocrine influences, unusual sensitivity to inadequate radiation or other therapy, allergic or immune reaction, and complete surgical removal of a growth. Another suggested possibility was the incorrect histologic diagnosis of malignancy.

FLAPPING TREMOR

Flapping tremor commonly associated with advanced liver disease is known in medicalese as

(Continued on page 52)

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MEDICAL NEWS *in brief*

(Continued from page 51)

"asterixis". This neurological symptom is not necessarily confined to hands; it may also involve elbows, shoulders, ankles and even lips and eyelids. Ever since it was first demonstrated in 1949, reports of its presence in a variety of non-hepatic disorders have appeared in the literature. Thus it has been observed in cor pulmonale, malabsorptive gastro-intestinal syndromes, hypomagnesæmia and uræmia. Claims have also been made for it in polycythæmia, hypocalcæmia and bromism. H. O. Conn recently reported its occurrence in six patients with chronic pulmonary disease (*New England J. Med.*, 259: 564, 1958). Except for one, all these patients were free of severe liver involvement and were obviously not in hepatic coma.

The presence of a high level of blood ammonium was thought at one time to be the etiological factor, but this hypothesis has been discarded. Another supposition along the same lines was that magnesium deficiency could be the cause of this abnormality. This seems substantiated by the disappearance of this disorder in a patient with prolonged diarrhœa who had been treated with magnesium free fluid parenterally and eventually responded to administration of magnesium. However, there is no objective evidence to support this theory. The electroencephalographic pattern seen in impending hepatic coma is characterized by the predominance of bilaterally synchronous slow delta and theta waves of increased voltage. This pattern has been observed in a considerable variety of diseases, among which were pulmonary insufficiency, uræmia, anæmia, Wernicke's encephalopathy and diffuse cerebral diseases. They have also been experimentally produced by hypoxia, hypoglycæmia and alcoholic intoxication. According to the author, "it seems more likely that each of a variety of metabolic or mechanical disturbances is capable of interfering with the basic oxidative process of cerebral metabolism. The wide variety of clinical situations in which asterixis has been observed suggests that this neurologic anomaly is a non-specific phenomenon of limited diagnostic value".

SHOCK AND ACUTE ABDOMINAL SYMPTOMS COMPLICATING ACUTE IDIOPATHIC PERICARDITIS

In three cases, shock and acute abdominal symptoms were associated with acute idiopathic pericarditis.

In one of the cases in shock, the serum glutamic oxalo-acetic transaminase activity was elevated. This was an unusual finding, and it probably reflected a severe degree of pericardial inflammation with concomitant subepicardial myocardial injury. Blood pressure responded promptly to administration of norepinephrine in both cases with shock.

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1. Murphy, H. L., and Klasson, D. H.: New York St. J. M. 57:1908, June 1, 1957

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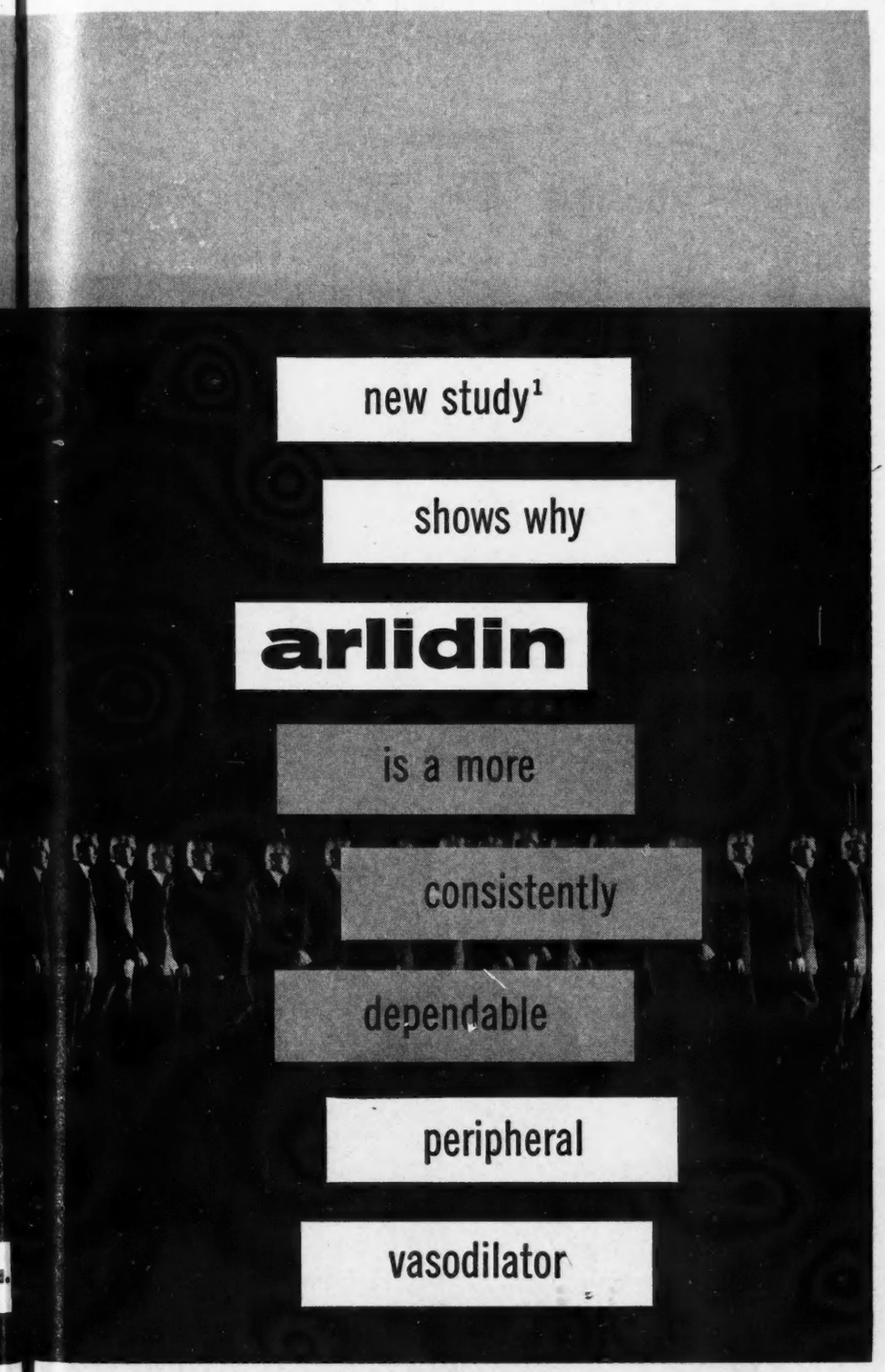
and frequent precordial auscultation are the most reliable means of recognizing the true cause of the symptoms and findings which at first may appear to be due to acute abdominal disease. – H. R. Witherbee, Jr. and M. L. Pearce: *Ann. Int. Med.*, 49: 876, 1958.

CHLORPROPAMIDE

Murray and his colleagues from Glasgow, Scotland (*Lancet*, 2: 553, 1958), report their experience in 43 cases of diabetes mellitus with a new preparation, chlorpropamide (N-propyl-N-(p-chlorobenzene sulfonyl)urea). Patients they studied were of the type most suitable for therapy with oral products; they had less than ten years' history of diabetes, were over 40 years old and had taken insulin, if at all, for not more than two years.

A satisfactory response to 1 gram of chlorpropamide daily was obtained in 28 of the 43 patients treated. It is suggested that this single daily dose should not be exceeded; if after a few days' treatment a good response is obtained at this level, the dose should be reduced to the lowest level found effective. The authors note that of the 28 cases responding satisfactorily to chlorpropamide, three had been given carbutamide, four had had tolbutamide, and eight had been tried with both. The impression gained was that chlorpropamide was somewhat less potent than carbutamide but more potent than tolbutamide.



DIABETIC NEUROPATHY PRECIPITATING AFTER INSTITUTION OF DIABETIC CONTROL

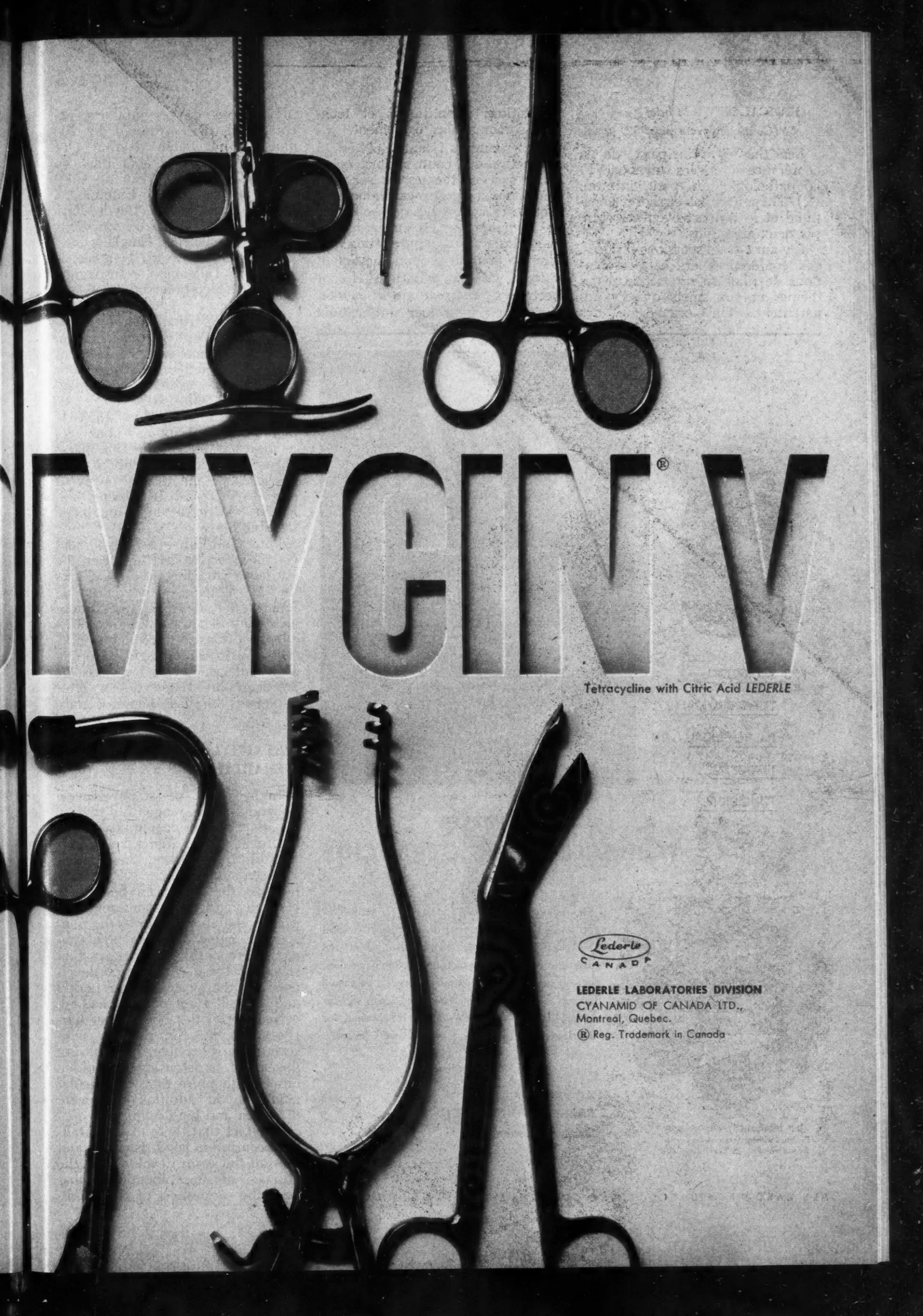
Contrary to the generally accepted dictum that diabetic neuropathy occurs only during uncontrolled diabetes, case reports are presented by Ellenberg (*Am. J. M. Sc.*, 236: 466, 1958) illustrating the onset or acute exacerbation of diabetic neuropathy after institution of control of the hyperglycæmia and glycosuria with insulin and diet. Although insulin has been suspected as the toxic etiologic agent under these circumstances, several factors seem to absolve it of this role. These include the facts that: (a) the neuropathy after institution of insulin control of the diabetes is identical with all other forms of diabetic neuropathy as regards symptoms, signs, spinal fluid findings, and course; (b) the neurological picture tends to improve and even return to normal despite the continued use of insulin; and (c) control of the diabetes by measures other than insulin may also precipitate neuropathy. Thus, insulin is not the noxious agent but acts as the medium for control of the diabetes which, in certain instances, leads to neuropathy.

CONGRES INTERNATIONAL DE GASTRO-ENTEROLOGIE

La sixième Conférence de l'Association des Sociétés Nationales Européennes et Méditerranéennes de Gastro-Entérologie, organisée par l'Association des Gastro-Entérologues Néerlandais, aura lieu à Leyde, Pays Bas, le 20-24 avril 1960.

(Continued on page 56)

ACHRO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MEDICAL NEWS *in brief*

(Continued from page 53)

Les thèmes principaux de la conférence seront les suivants: (1) la pathologie du petit intestin; (2) l'hépatite, la cirrhose hépatique et le rapport éventuel entre ces deux affections.

Il y aura des discussions dirigées, des conférences et des présentations de films se rapportant à ces thèmes et aux sujets qui s'y apparentent. On organisera des expositions scientifiques et technico-commerciales également.

Les auteurs sont invités à soumettre des contributions originales sur ces thèmes ou sur tout autre sujet gastro-entérologique, soit de caractère clinique soit dans le domaine des sciences fondamentales; après approbation du Comité pour le programme Scientifique ces contributions seront acceptées pour une discussion dirigée ou pour leur publication.

Les titres de ces rapports, accompagné d'un résumé de 200 mots au maximum devront être adressés avant le 1 août 1959, au Dr B. K. Boom, Bureau du Congrès, Section Gastro-Entérologie, Hôpital Universitaire, Leyde, Pays Bas.

Langue officielle: l'anglais.

Langues de travail: l'anglais, le français, l'allemand, l'espagnol, avec interprétation simultanée en ces 4 langues.

Frais de participation (y compris une réception officielle, un banquet et une excursion): pour les membres actifs: U.S. $45.— pour les membres associés accompagnants: U.S. $20.—

Dès le 1 novembre 1959 le montant d'inscription pour les membres actifs sera de U.S. $55.—

Les frais de participation cotés en dollars américains peuvent être payés aussi en florins hollandais ou toute autre monnaie transférable.

Pour tout autre renseignement comme pour l'inscription prière de s'adresser au Bureau du Congrès de la VI-ième Conférence de l'Association des Sociétés Nationales Européennes et Méditerranéennes de Gastro-Entérologie, Section Gastro-Entérologie, Hôpital Universitaire, Leyde, Pays Bas, ou au Secrétaire d'une des sociétés nationales de gastro-entérologues.

—

STAPHYLOCOCCAL DIARRHŒA

Eight cases of staphylococcal diarrhœa were recognized within six different surgical units of the Aberdeen Royal Infirmary in four months. In reporting these cases, Webster (*Lancet*, 2: 1036, 1958) believes that they can be missed clinically and even at autopsy. He prefers the above term to the non-specific name "pseudo-membranous enterocolitis", and stresses that seven of these eight cases developed in the postoperative period and that all eight patients had received antibiotics before the diarrhœa. Of the six patients with severe diarrhœa five died, having developed hypotension of sudden onset, high pulse rate and mental confusion in addition to severe diarrhœa and high fever.

The fact that three of the fatalities occurred in good-risk cases and that all the cases developed in the absence of an epidemic emphasizes the seriousness of the condi-

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tion. The author discusses the need for early diagnosis and energetic treatment with at times extremely large amounts of replacement fluid and appropriate antibiotics.

—

FOCAL NEPHRITIS DUE TO FOCAL INFECTION

Dorscheid and Hafermeister (*Deutsche med. Wchnschr.*, 83: 1937, 1958) have followed up 21 cases of hæmaturia and usually mild albuminuria for many years, without any of them developing evidence of chronic glomerulonephritis. In some of these patients, removal of foci of infection such as infected tonsils or teeth resulted in disappearance of albuminuria and hæmaturia. Renal function tests carried out in some of the patients revealed no impairment of function even during the period of hæmaturia. Although there have been attempts in recent years to deny the existence of focal nephritis as a distinct entity in the sense of Volhard's original description, the authors feel that the benign course of this group, its frequent response to removal of foci of infection, and its rare eventual termination in secondary contracted kidney justifies the retaining of the concept of "focal nephritis".

—

PROLONGED INTERMITTENT STEROID THERAPY FOR NEPHROSIS

Forty-six patients (35 children and 11 adults) suffering from either lipoid nephrosis or the nephrotic stage of glomerulonephritis were observed for a period of 21 to 84 months, on a regimen of ACTH for 2-3 weeks followed by intermittent oral administration of cortisone. All patients were treated for one year with 300-400 mg. of cortisone daily for three successive days each week. Antibiotics were given in the more recent cases, and potassium acetate was administered to those patients who showed sodium retention. Except for low salt diet there were no restrictions.

By using pooled data on a large group of nephrotics who did not receive any steroids or received them only when œdema was noted, the authors (Lange *et al.*, *J. A. M. A.*, 168: 377, 1958) plotted an expected death rate for their own series and found it to be 12.8 during a 65-month period. Actually only one of their patients died in that time. While admitting that the control group is not large enough to make this satisfactory for statistical evaluation of universal validity, the authors point to the well-known high mortality rate in these conditions. An important feature of the intermittent steroid therapy was the ability of the treated group to carry on normal activities. The children on this regimen showed normal growth and development, and no serious side effects were observed. Although a number of the patients would have gone into spontaneous remission, the authors advocate the use of intermittent steroid therapy as the only means of ensuring a favourable outcome in all patients with nephrosis.

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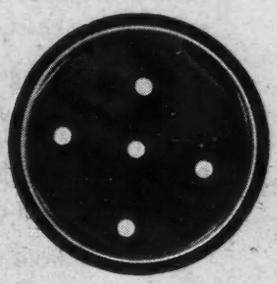
ANTIBIOTICS IN TONSILLITIS AND OTITIS MEDIA

Dr. John Fry, a general practitioner in the suburbs of London,

(Continued on page 60)

on the problem of antibiotic-resistant bacteria



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REFERENCE:* Nesbitt, R. E. L. Jr., and Young, J. E.: Obst. Gyn., N.Y. 10:89, 1957.

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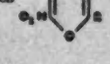

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Canad. M. A. J.
Jan. 1, 1959, vol. 80

Greetings for 1959

As we begin another year in the exciting task of recording the steady, and at times spectacular, growth of Canadian medicine, we send to all our readers hearty greetings and the wish that they may find in these pages things to interest and stimulate them in our common task of service to the community. We purposely do not say "service to the Canadian people" because copies of this Journal find their way regularly all over the world —to Paris and Oslo and Bucharest and Moscow, to Peking and Rangoon and Calcutta, to Cape Town and Manila and Buenos Aires—and we have the interests of our professional colleagues at heart, wherever they may be.

1959 is going to be an especially interesting year for the Canadian Medical Association, for it is a year in which we join forces with our British colleagues in a joint Annual Meeting. We will soon be giving you full details of the program for this meeting, which will be held in Edinburgh, July 18-24, but we would like to tell you a little about the program here and now.

Those of our members who plan to visit Edinburgh will find their first welcome at a reception in the Corn Market on Saturday evening, July 18. On Sunday, July 19, there will be an official Protestant service in the old Cathedral of St. Giles, and also a Roman Catholic service. In addition, there will be a choice of excursions and tours, and in the evening the BBC Scottish Orchestra will play in the Usher Hall.

On Monday, a gigantic program of scientific sessions will begin. This includes plenary sessions, round-table conferences, and sectional sessions which encompass every specialty from anatomy to the history of medicine. These sessions will continue through to Friday, July 24, when our hosts will hold a farewell evening party for Canadian visitors.

But in the meanwhile the social side of things will not be neglected. The hub of things for Canadians will be the beautiful rooms of the Assembly Club on St. George Street, just up the hill behind the famous Princes Street. The Club will be open every day from 9.30 a.m. to 11.30 p.m., will be the registration point for all Canadians, and will contain fully licensed catering facilities to sustain the metabolism during this strenuous week. There may even be dancing each evening. On Tuesday, July 22, the joint Annual Dinner will take place in the Waverley Market, Princes Street.

A very full program is being arranged for the ladies, including excursions in and around Edinburgh, and special arrangements are being made for entertaining young Canadians accompanying their parents to the meeting.

There will be the usual scientific and commercial exhibitions, a medical art exhibition, and a daily program of surgical operations and clinical demonstrations from the Edinburgh Royal Infirmary on closed-circuit colour television, sponsored by Smith, Kline and French Laboratories, Limited.

In fact, to twist the famous words of Dr. Johnson and apply them to the week of July 20-24, 1959, we can say: "a man who is tired of Edinburgh is tired of life, for there is in Edinburgh all that life can afford".

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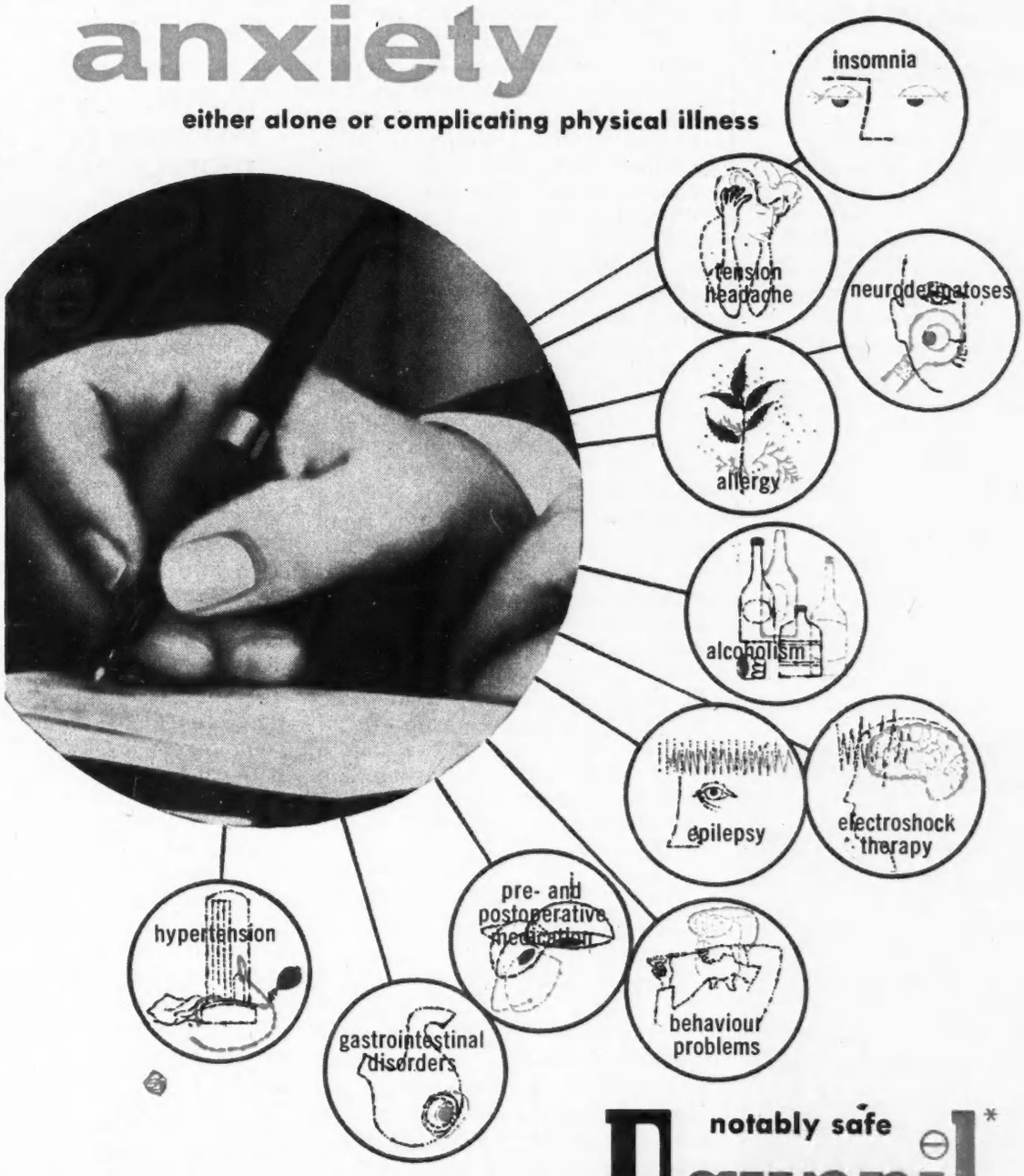
either alone or complicating physical illness



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MEDICAL NEWS *in brief*

(Continued from page 57)

England (*Brit. M. J.*, 2: 883, 1958), has made an attempt to assess in his practice the proportion of patients with acute tonsillitis and acute otitis media who required antibiotics. He studied 482 attacks of acute tonsillitis and 552 attacks of acute otitis media treated on the principle of withholding penicillin unless there were definite indications for it. With this routine, he found that antibiotics were required in 25% of all attacks of acute tonsillitis (19% in non-streptococcal infections and 3% in hæmolytic streptococcal infections) and 22% of cases of acute otitis media.

Results in his series were eminently satisfactory. No real complications occurred in either group, and only three children were later found to be slightly deaf with an abnormal drum. While this small and highly personal study may not have widely applicable results, it suggests that very large proportions of cases of acute tonsillitis and acute otitis media will settle down naturally and safely without specific drugs. Dr. Fry says that "once the initial decision is made to wait and see for a day or two before using [antibiotics], it is astounding how many cases of acute tonsillitis and acute otitis media will recover on their own."

—

ACENOCOUMAROL (SINTROM) AS AN ANTICOAGULANT

In a series of 100 hospital patients in Boston, Rullo and his colleagues (*J. A. M. A.*, 168: 743, 1958) assessed the effects of acenocoumarol (Sintrom), an orally administered anticoagulant with intermediate duration of effect. The largest group in the series consisted of 28 patients with spontaneous acute peripheral phlebitis, and treatment was aimed to keep the prothrombin time within the therapeutic range of 23 to 37 seconds. Tablets were administered once a day, and the initial dose was 21 mg. on the average, with those on the second day ranging from 0 to 20 mg. The maximum duration of therapy was five days. The agent was found to be dependable and its effects predictable. The only toxic reactions observed were a few minor hæmorrhagic manifestations. Acenocoumarol usually brought the prothrombin time into the clinically practical range within 18 hours, and the average maintenance dose was then 6.6 mg. per day.

—

POSTOPERATIVE INFECTION IN THORACIC SURGERY

In a paper discussing the incidence and manifestations of postoperative infection after 584 thoracotomies, Lund of Copenhagen (*Acta chir. scandinav.*, 114: 419, 1958) comments that information on this aspect of thoracic surgery is somewhat scanty. He reviewed his series of cases operated upon between 1949 and 1956 in the Copenhagen County Hospital, and found an incidence of 8.2% of postoperative infection. Because there was a male predominance in patients with cancer of the lung, infections were preponderantly in males (5 to 1). The infection rate also went up with the patient's age. The highest infection rate was in the tuberculous group (13%) as compared with 10% in patients with cancer of the lung, bronchiectasis and bronchial asthma. After "clean" operations, the risk of infection is relatively slight, under 3%. Primary thoracoplasty carries an infection rate of almost 6%. On the other hand, the risk of infection is much higher in operations involving division of the bronchus, or its branches, going up to 23% after segmental resection. Drainage is not of very much significance as a factor in infection, but undrained pneumonectomy was followed by infection in 10%. Infection is probably bronchogenic. The commonest type of infection was empyema often associated with bronchial fistula, and the commonest microorganisms were staphylococci resistant to penicillin and streptomycin, resistant strains of *B. coli*, Klebsiella, and occasionally Proteus and Pyocyaneus. The majority of nasal staphylococci isolated from hospital staff were of the same type as those isolated from the patients. Mortality rates were 15% for non-infected and 27% for infected patients, while the average stay in hospital was three to four times longer in the latter group.